Telephony.

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The Right of Physical Connection.

Neither under the statutes of Tennessee (acts of 1885 c. 66, sections 10 and 11) nor at common law, is a telephone company bound to permit another such company to make physical connection with its lines and switchboards for use as its subscribers use them, nor would the execution of a contract between two telephone companies, giving such right of physical connection for an indefinite time, prevent the owning company from severing such connections. So held the Supreme Court of Tennessee in a recent suit brought by the Home Telephone Co., of Morristown, Tenn., against the People's Telephone & Telegraph Co., of Knoxville, and another company.

There was an operating agreement between the two companies for the interchange of business, whereby each was given the right to use the lines of the other at an agreed rate for messages or conferences. The suit was brought to compel the two defendants to make an electrical connection so as to give the complainant the benefit of the lines of the two defendants; and secure for the complainant the effect of consolidation of the three lines.

The court further held that the joint traffic arrangement would not confer any rights upon companies not parties to the contract. This decision is not in harmony with the decision of the courts of Indiana, which held, under State vs. Cadwallader, 172 Ind. 619, 87 N. E. 644, 89 N. E., 319 that if the telephone company makes a contract for an indefinite time with some third company, it loses its independent status and cannot withdraw.

A holding, such as that made by the Indiana court, would, according to the Supreme Court of Tennessee, be unconstitutional because it would authorize the taking of property without due process of laf.

The Design of Telephone Pole Lines.

At the recent Portland meeting of the American Institute of Electrical Engineers A. H. Griswold presented a very interesting paper on the conditions which must be taken into consideration in the design of pole lines in the territory west of the Rocky Mountains. The paper which is published in full, on other pages, describes conditions peculiar to the Western country and the steps taken by telephone companies to build pole lines which will withstand the climatic and other difficulties.

The discussion which followed this paper brought out a number of points not mentioned in the paper. Reference was made to the "California splice," which is formed by lashing to the tops of short poles two pieces of timber, 4 in. x 6 in., by means of an angle iron, straps and bolts. This form of splice has come into quite general use even by the power transmission companies where poles of great length are necessary. It is adapted only to square poles.

The telephone and telegraph companies near Stockton, Cal., have experienced much trouble in the marshes where the poles are set in peat bogs. The peat catches fire and the poles are burned off beneath the surface. An attempt was made to remedy this difficulty by placing a one-half inch band of concrete around the pole bases, but the rapid decay which resulted indicated that the remedy was almost as bad as the trouble. It was suggested that an annular countersunk rim at the top of the concrete band filled with asphaltum paint might prevent the decay.

Another peculiar condition with which one of the operating telephone companies has to contend, is on the telephone line between Truckee and Lake Yahoe, Cal. In that region the copper wires appear to be attacked by a gas which permeates the air and causes a green scale to form on the conductors eventually destroying them. The gas cannot be detected by any ordinary method.

Size of New Coins Important to Telephone Companies.

A bill, recently passed in the House of Representatives, provides for the coinage of three-cent and half-cent pieces. A recent isue of the Chicago Record-Herald comments as follows upon the proposed new coinage:

"The lower house of Congress has passed the Bulkeley bill for the coinage of three-cent and half-cent pieces.

Secretary MacVeagh, who favors the measure, says the half-cent will benefit the slot machine manufacturers. The three-cent piece will be of special usefulness in cities where a three-cent fare is the rule on the street cars. It has been proposed to make it the size of a nickel, but to have a hole in the middle so that the coin can be readily distinguished.

"That the three-cent piece, with or without a hole in it but so made as to be distinctive of other coins, would be useful, is probable. The half-cent is open to greater doubt. A cent is a small amount of money in these days of high cost of living. In the far West for many years it was looked upon with contempt; today it is not common in the Pacific Coast states, though coming into use gradually. Its introduction marks the passage of the lavish spirit of former days and closer attention to 'saving the pennies' on the part of everyone. Between the one-cent and the five-cent piece there may well be a convenient coin."

Should the size for the three-cent piece be made the same as that of the five-cent piece, telephone companies will encounter a great amount of trouble with its being used in the pay station machines. It would place the telephone companies practically at the mercy of anyone caring to substitute the proposed three-cent piece for a five cent one in payment for telephone calls.

As the bill has not been acted upon by the Senate, telephone officials by immediate action can prevent loss from this new and unexpected danger. Letters should be sent to senators vigorously urging that decidedly different dimensions from those proposed, be specified for the three-cent piece.

W. J. Thill, secretary of the Iowa Independent Telephone Association has sent a circular letter to the Iowa telephone men, asking that they write at once to the Iowa senators, protesting vigorously against the proposed dimensions of the coin.

The Telephone as an Entertainer.

In March an account was published of an after-dinner speech made by President Hadley of Yale from New Haven, Connecticut, to the members of the Chicago Yale Club on the occasion of their annual banquet. The long distance telephone was the medium used in transmitting the speech and since then it has been used on several occasions of similar nature.

Only a few weeks ago, a joint meeting of the Associated Press and American Newspaper Publishers' Association was held at the Waldorf-Astoria Hotel in New York. Over seven hundred newspaper men from all parts of the country were present at the banquet which will long be remembered on account of the unusual after-dinner program.

Each of the guests was provided with a special watch case telephone receiver and a varied program of after-dinner speeches, songs and recitations was heard over the telephone wires. The first speaker was President Taft, who at that time was in Boston. His speech was greeted with applause which the President heard over a return telephone circuit connected to a special transmitter located on one side of the dining hall.

The telephone connections were changed and the voice of Premier Robert L. Borden of Canada was heard. Mr. Borden spoke over a distance of several hundred miles, from Hot Springs, Virginia.

This speech was followed by a poem of Kipling's which was recited at Daly's Theatre by Lewis Waller and at the Winter Garden, another New York theatre, a Southern song was sung for the benefit of the banqueters by Jose A. Collins.

This demonstration of the development of the telephone was heard by the two men who were most active in its early development, Dr. Alexander Graham Bell and Thomas A. Edison. Their presence was acknowledged by toasts which were proposed in their honor.

It was only twenty-five years ago that Edward Bellamy made a prophecy regarding the telephone which has been fulfilled. In his book "Looking Backward," the happenings are described as taking place in the year 2000. The part relating to the telephone, the reality of which has come to pass in such a comparatively short time, is as follows:

"Following my hostess into an apartment with a floor of polished wood, I was prepared for new devices in musical instruments. I saw, however, nothing in the room which by any stretch of imagination could be conceived as such.

"A card bore the date 'Sept. 12th, 2000,' and contained the longest program of music I had ever seen. It was as various as it was long, including a most extraordinary range of vocal and instrumental solos, duets, quartets, and various orchestral combinations. I observed the prodigious program was an all-day one, divided into 24 sections, answering to the hours.

"The hour being 5 p. m. I selected a waltz under that hour. My hostess merely touched one or two screws and at once the room was filled with the music of a grand organ anthem; filled, not flooded; for, by some means the volume of melody had been perfectly graduated to the size of the apartment.

"I listened, scarcely breathing, to the close. 'There is nothing in the least myterious about the music,' said my hostess. 'It is not made by fairies or genii, but by good, honest, and exceedingly clever human hands. We have simply carried the idea of labor saving by co-operation into our musical service as into everything else. There are a number of music rooms in the city perfectly adapted, acoustically, to the different sorts of music. These halls are connected by telephone with all the the houses of the city whose people care to pay a small fee. Either one of the four pieces now going on may be heard by merely pressing the button, which will connect your house wire with the hall, where it is being rendered.'

"An hour or two later I again accompanied the hostess to the music room. We had not more than seated ourselves comfortably when a tinkle of a bell was heard and a few moments after the voice of a man, at the pitch of ordinary conversation, addressed us, with an effect of proceeding from an invisible person in the room.

"My hostess suggested that if I preferred she could connect us with Mr. Sweetser's speaking room. As she spoke her father touched another screw and the voice of another speaker filled the room with earnest, sympathetic tones."

The musical service furnished by a telephone company in an Eastern city, the telephone news service of another city and the telephone train announcing apparatus are additional cases which may be cited of the fulfillment of this prophesy.

Telephone Pole Line Design West of the Rockies*

The Trying Conditions Peculiar to the Western Territory—Available Pole Supply—Destructive Influences—Methods of Testing Poles—Classification and Specifications—Spacing of Poles—Loads and Sags of Wires—Cross Arms and Pins

By A. H. Griswold

One of the most important portions of the outside plant of the companies engaged in the transmission of energy or intelligence, is the structure for supporting the conductors, and as such it is receiving a constantly increasing consideration from engineers, as the value of an uninterrupted service at the least cost is being realized.

Of the companies using pole lines in the states west of the Rocky mountains, the Pacific Telephone & Telegraph Co. undoubtedly has the most invested, encounters the greatest diversity of conditions, and covers more territory than any other company. For these reasons, this article will be devoted largely to the practises of this company.

WEATHER CONDITIONS.

One of the most important factors in the design of pole lines is the variation in weather conditions and, in the region under consideration, these conditions range from the mildest to the most extreme.

In Oregon and Washington, the destructive "pogonit" and "silver thaw" occur. The former is a weather condition encountered near Spokane, Wash. The word "pogonit" is an Indian name given heavy fogs which drift inland and freeze on cold exposed surfaces. The accumulation of ice on the wires sometimes to a diameter of about four in. (10 cm.) frequently causes complete failure, especially when followed by winds of high velocity.

The "silver thaw," while in many respects similiar to sleet storms encountered in other parts of the country, is a name applied to a peculiar condition existing in Portland, Ore., and the near vicinity. Portland is situated at the junction of the Willamette and Columbia Rivers. The winter climate of the Willamette Valley is temperate while that of the Columbia Valley is very severe. A very cold east wave passes down the Columbia Valley and settles over Portland. This wave is usually of a temperature of from 5 to 22 degrees Fahrenheit. A southerly wind from the Willamette Valley then sweeps the moisture laden clouds toward Portland, the clouds being deflected to the upper strata by the hills south of the city and over the cold air from the east. Precipitation then starts from the upper strata; freezing in passing through the cold lower strata and chrystallizing on all solid objects. This condition has occurred in the past on an average of every four years since 1871 (before which time no records were kept). During this period, however, there have been only three storms which have been severe, those of 1881, 1907 and 1912. During the last storm all aerial plant in Portland was coated with from one-half to one in. (13 to 25 mm.) of solid ice. See views in Fig. 1.

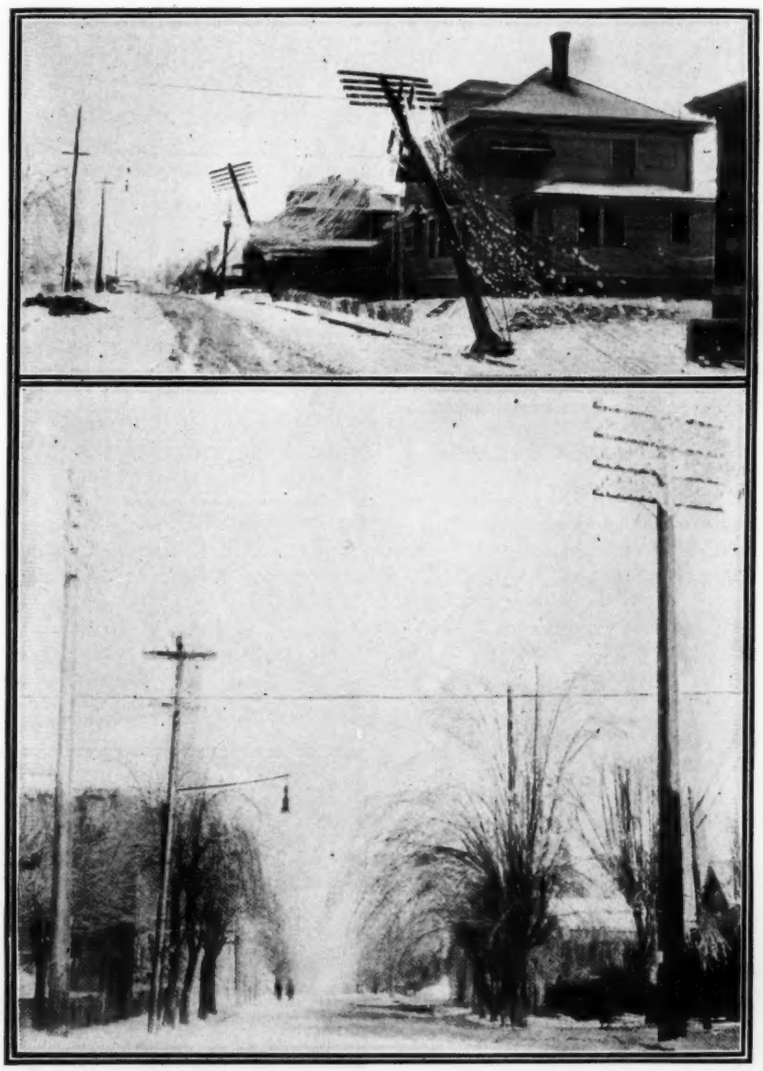

Fig. 1. Effect of "Silver Thaw" on Obsolescent Pole Construction and on Modern Standard Toll Line.

On the Coast range and high Sierras, high winds, low temperatures, sleet and great depth of snow are experienced. In some portions, such as at Summit, Cal., the government records show the anr ial average snowfall to exceed 36 ft. (10.9 m.) and occasionally the annual fall exceeds 65 ft. (19.8 m.) During long continued storms, the snow sometimes reaches a depth sufficient to cover the entire pole line, burying it under many tons of snow, and during subsequent changes of weather conditions, a crust forms and gradually sinks, crushing the whole line by sheer weight.

In the southeastern portion of California, embracing the territory of San Bernardino and Colorado Deserts, one of the highest ranges of temperature in the United States

*A paper presented at the Pacific Coast Meeting of the American Institute of Electrical Engineers, Portland, Ore., April 16-20, 1912.

occurs. Government records show that the annual range of temperature in that region varies from the freezing point to over 130 degrees Fahrenheit. A temperature of over 140 degrees has been reported. Such great temperature changes makes it necessary to exercise great care in string-

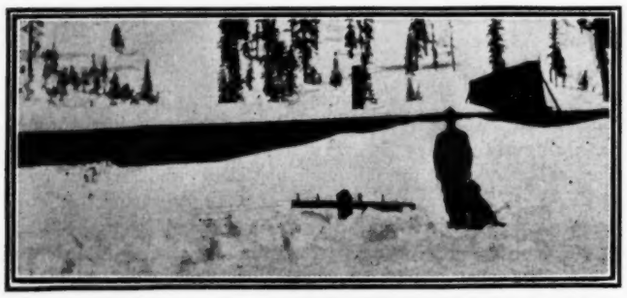

Fig. 2. Heavy Snowfall, Cisco, Cal. Toll Lead Almost Buried.

ing the conductors. An exact relation between sag and temperature must be maintained to prevent dangerous stresses arising during subsequent falls in temperature.

On the mountains bordering the Pacific Coast, especially along certain exposed portions of the coast, high winds are encountered. On the eastern edge of the mountains bordering the western side of Death Valley and the Salton or

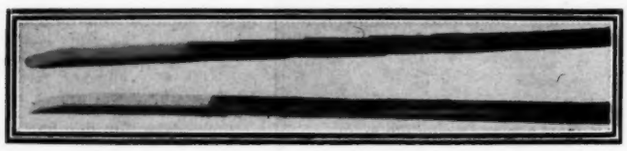

Fig. 3. Erosive Effect of Sand Storms.

Colorado Desert, the winds often reach the magnitude of a hurricane. High velocities are recorded annually during the months from October to March. Along the entire coast, and throughout the larger portion of Southern California, weather conditions of unusual mildness prevail. It is evident, therefore, that weather conditions as severe as any in the United States, as well as the most mild conditions, must be met in the design of pole lines.

Poles.

Supply. Of the available supply of timber existing in any quantity west of the Rocky mountains, but three kinds are suitable for poles in the untreated form—Western red cedar, (thuja plicata) commonly known as Western white cedar, redwood (sequoia sempervirens), and Port Orford cedar or Lawson cypress, (chamaecypris Lawsoniana). Due to the limited supply of Port Orford cedar, it is not of much importance, notwithstanding its virtues. When open-tank or pressure preservative treatment becomes general, the field of available pole timber will be much widened by the use of such woods as lodgepole pine, yellow pine, Douglas fir, tamarack and other conifers.

With a few exceptions, redwood is used for poles only in the sawn form, and since redwood is used very extensively for structural purposes, the price depends upon the market price of redwood lumber, which fluctuates considerably. Unlike redwood, which is sawn from very large trees, cedar is generally used in its natural form. Inasmuch as the demand for poles is probably much more uniform than for lumber, and also because of the fact that the greater portion of the timber used for poles would be of little value for other purposes, the price of cedar poles is comparatively uniform.

It is often economical to use sawn redwood poles where there is an excessive demand for any one size, because of the facility with which poles of a given size may be provided, and at the same time not react unfavorably on the price, as it would in the case of a heavy demand for a particular size of corresponding cedar poles. This economy was recently practiced in the construction of a line from Banning, Cal., to Yuma, Ariz., where approximately 7,000 red-wood poles of the same dimensions were used—20 ft. (6.1 m.) long, 5 in. (12.7 cm.) tops, 9 in. (22.8 cm.) butts.

At present the supply of cedar poles is obtained principally from that part of Washington adjoining Puget Sound, because of the cheap water transportation to other points on the Pacific Coast. There is still much available pole timber in the interior of Washington, Oregon and Idaho, which has not yet been drawn on to any great extent.

In many portions of the Western timber country, there are large quantities of fire killed timber conveniently situated for water transportation. This timber has heretofore been considered worthless either for structural purposes or for poles, but from recent investigation it is thought to be as valuable for poles as live timber. It will probably come into extensive use in the near future, as it comprises about 15 per cent. of the available pole supply. These poles are particularly adapted to treating because of their thorough seasoning.

Split cedar poles have a limited use in localities where small round cedar poles are not available. These poles are obtained by splitting larger trees where it is not economical to have them sawn. It is generally conceded that they are more resistant to decay than sawn poles, because the cells are not opened as in sawing. However, they are very unsightly and are not used where the appearance of the lead is essential

Destructive Influences. Of all factors which tend to influence the selection of a timber for pole work, the rate of butt rot is undoubtedly the most important. Even when exposed to the same conditions, the life of untreated poles of equal size may vary from two to twenty years or more, depending on the variety. However, if a pole could be large enough, it could be designed for any reasonable definite life if the rate of rot could be determined.

The generally accepted theory of rot is that it is caused by a low form of life termed fungus which excretes substances which either dissolve or cause a gradual deterioration of the fibre of the wood. Many conditions enter to affect the rate of rot of a given pole, *i. e.*, the moisture, temperature, air supply, the food value to the fungi of the wood in question, nature of the soil, amount of drainage, and perhaps the stresses to which the pole is subject. The latter at first may

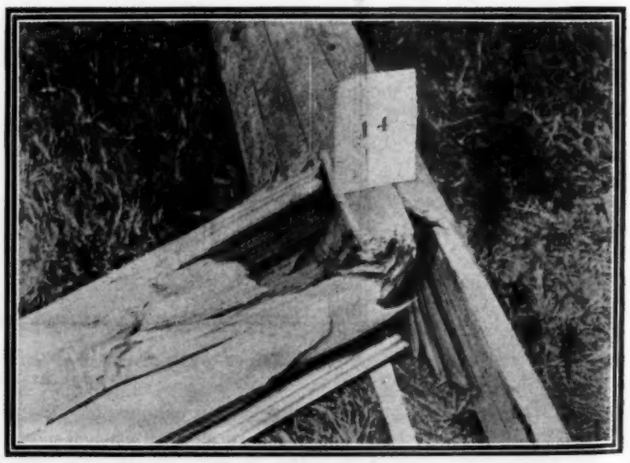

Fig. 4. Typical Break of Western Cedar from Idaho.

not seem important, yet it has been noticed that corner poles, and poles subject to repeated shock, rot at a considerably more rapid rate than others, possibly due to fibre fatigue and the consequent lessening of the timber resistance to decay. The four essentials to rot, or the life of the fungi, are air supply,

moisture, warmth and food. The absence of any one of these will prevent decay.

The principle underlying nearly all preservative treatments is the removal of any one or more of these essentials. The difficulty of regulating the first three, *i. e.*, air supply, moisture and temperature, may be readily appreciated, but the removal of the food value may be accomplished by impregnating the timber with some toxic substance, such as creosote, zinc-chloride of copper sulphate. The latter two salts leach out quite rapidly, but the creosote will remain in the wood for quite an extended period, even when submerged in water, and is effective in preventing fungi from entering the wood.

The other agencies acting at the base or ground line of the pole, such as erosion, fibre fatigue, or chemical decomposition in the direct sense, are of little importance in the absence of fungi.

However, butt rot is by no means the only destructive influence encountered. In the San Joaquin Valley, near Middle River, a section of line a number of miles in length has several times been burned by slow peat fires. If this trouble becomes more serious, it may be necessary to imbed the poles in a footing of loose gravel of sufficient thickness to prevent the heat from injuring the pole. For a short distance over the Yuma-Los Angeles line, after entering the desert country, the poles are subject to a sand-blasting action due to the sand carried by the

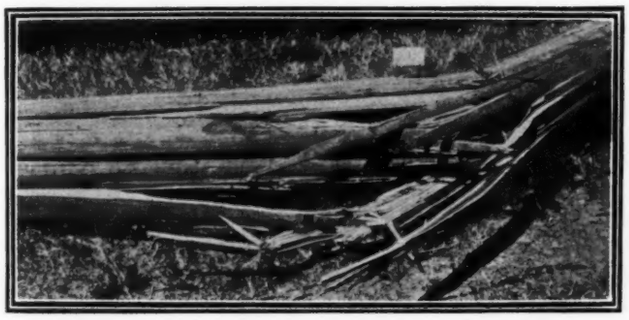

Fig. 5. Typical Break of Port Orford Cedar.

strong winds. Fig. 3 illustrates the destructive effect of these storms on survey stakes which were in the ground for a period of only four or five months. Many remedies have been suggested, such as non-drying paint which will collect a sand coating, metal sheathing, or some paint which would present a hard stone-like surface. For a number of years the Western Union Telegraph Co. has protected its poles from this action by placing stubs on the windward side.

In addition to the conditions named, which work towards the destruction of pole lines, there are storms, fires, white ants, woodpeckers and other minor agencies.

Rule of Decay. As before stated, the life of any given pole is very uncertain. However, if a sufficient number of measurements are taken at the point where maximum decay occurs, a very close determination of the average rate of decay of any given wood may be determined for a given territory.

A very extended determination of the average rate of butt rot of Eastern white cedar has placed it at about 0.3 in. (7.6 mm.) in circumference per year as an average under all conditions. That of Western cedar is probably approximately the same. However, steps are being taken to determine this rate accurately for the Pacific Coast for redwood and Western cedar poles. The rate for redwood varies with the physical characteristics of the wood. Some portions of the butts (*i. e.*, "butt cuts") show remarkable resistance to decay, while sapling and "top cuts" often decay rapidly. The rate of decay of sawn redwood is now considered to be approximately the same as that of cedar, although this is probably too great due to the fact that sawn redwood poles contain no sapwood.

In this connection, it might be interesting to state that the point at which decay proceeds most rapidly is just below the ground line for Eastern cedar, and about four to eight in. (10.1 to 20.3 cm.) below for Western cedar.

Strength of Poles. Realizing the importance of Western cedar and the necessity for definite information regarding its physical characteristics, the Pacific Telephone and Telegraph

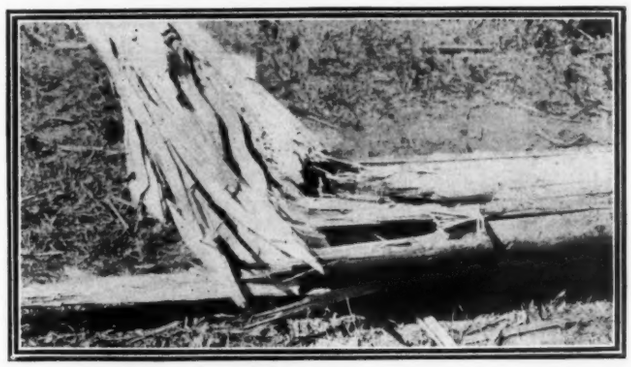

Fig. 6. Typical Break of Western Cedar from Washington.

Co. undertook to obtain the modulus of rupture or the ultimate unit outer fibre stress of poles used in the construction of its lines.

It is a well established fact that in order to obtain the true modulus of rupture of a given timber, actual structural timber must be tested. Since this is the first test performed in the West on poles in a manner closely approximating the conditions existing in the line, it may be of interest to describe somewhat in detail the methods of conducting the test and the conclusions drawn.

Specimens. Eighty poles were carefully selected as representative of the forest run used for pole work. They were of three classes—Western cedar from Idaho, Western cedar from Washington and Port Orford cedar from the western slopes of Oregon. From each of these three classes specimens were selected as follows:

Length		6-in. (15.2 cm.) top	7-in. (17.7 cm.) top	8-in. (20.3 cm.) top	9-in. (22.8 cm.) top
ft.	m.				
25	7.6	3 or more	3 or more	3 or more	
30	9.1	3 or more	3 or more	3 or more	
35	10.6		3 or more	3 or more	3 or more

The Western cedar at the time of the test had been cut

Fig. 7. Effect of Axe Cuts in Locating Fracture Points.

from one to eight years from live growing timber. The poles were about equally divided between summer and winter cut. The Port Orford cedar had been summer-cut 23 months before testing, from fire-killed standing timber. As would be expected from the length of time they had

been cut, the poles were well air-seasoned. No consistent method was followed in seasoning, and consequently some poles contained very large weather checks, while others which received less rigorous treatment were in good condition.

Apparatus. Figs. 9 and 10 give a clear idea of the apparatus and its dimensions. The uprights were made of 12

Fig. 8. Excess of Sapwood Effect, Due to Rapid Growth.

in. by 12 in. (30.5 by 30.5 cm.) Douglas fir, thus making the apparatus very rigid. The conditions of actual service were duplicated as nearly as possible, the pole being inserted between the uprights six ft. (1.8 m.) from the butt, or at about the average ground line. The main part of the pole extended forward free from all obstructions to a metal covered platform where the end rested upon a metal carriage, which in turn traveled on the metal platform. The carriage was provided with easily running truck castors to facilitate its travel in a circular path. A constant pull of ten pounds (4.5 kg.) was necessary to overcome the friction of the carriage, final readings being corrected by this amount.

All deflection readings for the crushing of the pole at the butt and ground line, the movement of the machine and the top deflections were taken from stakes driven into the ground, and entirely independent of the machine. The top deflections were corrected for the crushing at the ground line and butt and the movement of machine by an amount equal to $D_b \frac{(2L-K)}{K}$

Where L = length of pole.
K = distance between supports
D_b = movement of pole at B (See B, Fig. 5)
due to crushing of wood and movement of support.
This formula applies only to the case where the movement at A and B is the same, which was found to be true in practically all cases.

The traction dynamometer was calibrated, the true reading being plotted against the observed reading. The winch and tackle gave a mechanical advantage of 150.

Method of Conducting Test. The test specimen was first carefully examined and noted for defects, such as injuries to sapwood from rough handling, grubs, worms, ants, bark trimmer's axes, weather checks (star or ring), butt or top rot, large knots, an excess of sapwood or very irregular sections. The weight was obtained by the use of a pair of spring scales suspended from a tripod. The dimensions of the pole obtained were top circumference, butt circumference, circumference six feet (1.8 m.) from the butt, circumference of the center, in inches, and the length in feet.

The specimen was then lifted into the machine, six feet (1.8 m.) of the butt blocked tightly against the uprights, and an initial tension put into the rigging to clear all obstruction. The length of the lever arm was then obtained.

The pole was deflected at the constant rate of one foot (30.5 cm.) per minute until failure took place, deflection readings being taken at the top, ground line and butt for each load increment of 100 lb. (45.3 kg.) The top readings were taken from a nail driven into the center of the pole to avoid errors due to unequal fibre strain or rolling.

After failure, the distances from the point of fracture to the top and ground line were measured. The circumference at the point of fracture was calculated from the dimensions previously obtained. After examining the nature of the fracture and photographing, a one-inch (25.4 mm.) section to be used as a moisture sample was obtained as near the point of failure as possible. These sections were also used to obtain the rings per inch and percentage of sapwood. The samples were weighted immediately after cutting and again after being oven-dried to a constant weight, the percentage of moisture being then calculated in terms of the dry weight. Figs. 4 to 8 show typical fractures for the woods tested and the effects of the various defects encountered.

Calculations of Tests. The pole was treated as a tapered cantilever beam and the calculations for the modulus of rupture made by means of the fundamental formula, $S = \frac{MC}{I}$ assuming that this law holds to the point of rupture. In obtaining the volumes and weights per cubic foot, the pole was treated as a truncated cone.

Following are the data obtained, and curves, Fig. 11, show the comparative strength of the timbers tested:

POLES 1-27 INCL.
WESTERN CEDAR (THUJA PLICATA) FROM IDAHO.

Modulus of rupture lb. per sq. in.	Moisture content per cent.	Sapwood per cent. of total area	Rings per inch	Weight per cu. ft. lb.	Load at failure lb.
5,270	10.	26.	20.	22.7	2,214 (1,004.2 kg.)

POLES 28-51 INCL.
LAWSON CYPRESS OR PORT ORFORD CEDAR (CHAMAECYPARIS LAWSONIANA.)
From Western Slopes of Oregon.

7,220	12.		16.	26.7	3,040 (1,378.9 kg.)

POLES 55-81 INCL.
WESTERN CEDAR (THUJA PLICATA) FROM OREGON AND WASHINGTON.

5,350	15.	34.	12.	21.9	1,928 874.5 kg.)

Note.—The per cent. of sapwood was not calculated on Port Orford Cedar because of the difficulty in differentiating between the heart and sapwood on many of the samples.

Conclusions from Tests. Weather checks are an important factor in the weakening of Port Orford cedar, and as in the case of red cedar, the more rapid the growth the weaker the pole.

The analysis of the cause of weakness of any pole was made difficult by the insufficient data on the history of the particular poles tested. The principal causes of weakness of Western red cedar, in order of their importance, seemed to be:

1. Injury to sapwood { *A* Teredo pitting; *B* Bark trimmer's axe cuts (See Fig. 7.); *C* *Bruising.*
2. Rapid growth
3. Excessive sapwood (See Fig. 8)
4. Weather checks
5. Knots.

Injury to sapwood, although of very great importance in reducing the initial strength of the pole, has prob-

ably no bearing on the effective life. No center rot being encountered, conclusions were not formed as to its bearing on the strength of the pole.

Due to the low moisture content of the poles tested, no conclusions could be drawn as to the effect of moisture on the strength of poles. However, since poles used in line construction are generally cut several months before being set, they are usually moderately well seasoned, and under such conditions the moisture content cannot be considered of any great importance.

The results of the tests of Port Orford cedar are far more consistent than those of Western cedar, due probably to the timber being more uniform in age and quality.

The data show definitely that the Western poles are not of an economical taper and that the ground line is the critical point.

In obtaining the data given above, only those poles which contained defects as listed in the specification adopted by the Pacific Telephone & Telegraph Co. were discarded.

Classification and Specifications.

The strength and rate of rot of poles are of fundamental importance in determining their life under a given load. The ultimate load to which the pole is subject may be determined with a reasonable degree of accuracy. The life assigned is dependent upon the increase of load necessitated by the development of the surrounding country, probable changes in equipment and new laws or ordinances affecting the construction and the economical life as determined by a cost study. With the life assigned and the load known, it is only necessary in order to obtain the original circumference at the time of setting, to add sufficient wood to allow for the rot at the ground line during the life of the pole.

In drafting specifications for poles, it is desirable to utilize as great a portion of the forest run of poles as possible, in order that there shall be no reaction on the price due to the excessive demand for any particular size.

The following specifications based on these factors for Western cedar poles, with the classes assigned according to the importance and size of the lead, will further illustrate the application of this principle.

Length of poles		A (Minimum top circumference 28 in. (71.1 cm.) Circumference 6 ft. from butt		B (Minimum top circumference 25 in. (63.5 cm.) Circumference 6 ft. from butt		C (Minimum top circumference 22 in. (55.8 cm.) Circumference 6 ft. from butt		D (Minimum top circumference 18½ in. (47 cm.) Circumference 6 ft. from butt		E (Minimum top circumference 15 in. (38.1 cm.)	F (Minimum top circumference 12 in. (30.5 cm.)
ft	meters	in.	cm.	in.	cm.	in.	cm.	in.	cm.		
20	6.1	30	76.2	28	71.1	26	66.0	24	60.9	No butt	No butt
22	6.7	32	81.3	30	76.2	27	68.6	25	63.5	require-	require-
25	7.6	34	86.3	31	78.7	28	71.1	26	66.0	ment	ment
30	9.1	37	94.0	34	86.3	30	76.2	28	71.1		
35	10.6	40	101.6	36	91.4	32	81.3	30	76.2		
40	12.2	43	109.2	38	96.5	34	86.3	32	81.3		
45	13.7	45	114.3	40	101.6	36	91.4	34	86.3		
50	15.2	47	119.3	42	106.7	38	96.5	36	91.4		
55	16.7	49	124.4	44	111.7	40	101.6	38	96.5		
60	18.3	52	132.1	46	116.8	41	104.1	39	99.0		
65	19.8	54	137.1	48	121.9	43	109.2				

The foregoing specifications do not require seasoned poles; however, it is preferable to use seasoned poles because of the lessened weight and subsequent lessening of the cost of freight charges and handling. Well seasoned cedar poles may lose from 20 to 35 per cent. of the original weight, depending on the season in which they are cut. Autumn and winter cut poles will usually lose the greatest percentage of weight. A material increase of strength follows thorough seasoning. The weights of green poles vary from 34 to 39 lb. (15.4 to 17.7 kg.) per cubic foot (0.0283 cu. m.), while those of seasoned poles may be from 20 to 26 lb. (9.07 to 11.8 kg.) per cubic foot.

The top size specifications in general use at present are entirely irrational inasmuch as the top size of a round pole is no indication of its desirability or life under a given condition. The taper may vary considerably on a given top size pole, depending upon the environment in which

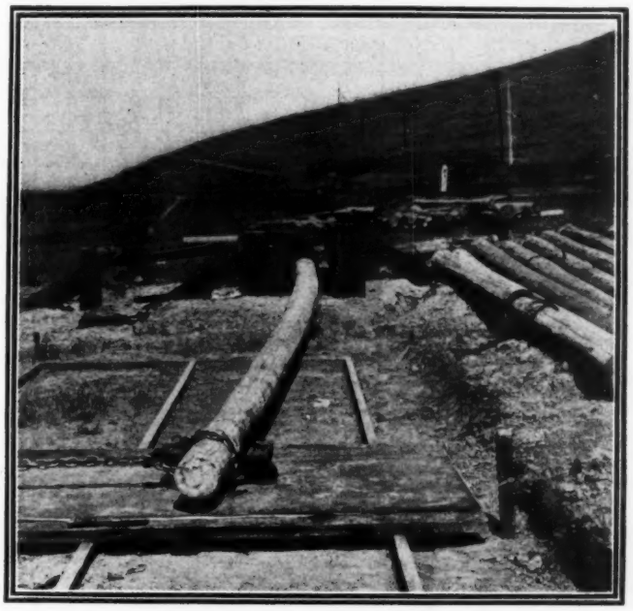

Fig. 9. General View of Testing Apparatus.

it was grown, the judgment of the cutter and many other uncertain factors.

The average circumference taper of Western cedar is slightly less than three in. (76.2 mm.) per 8 ft. (2.44 m.) of length, while that of Port Orford cedar is three in. in circumference per 10 ft. (3.05 m.) of length.

A pole of economical taper, disregarding decay, would be one that theoretically would not break at any one

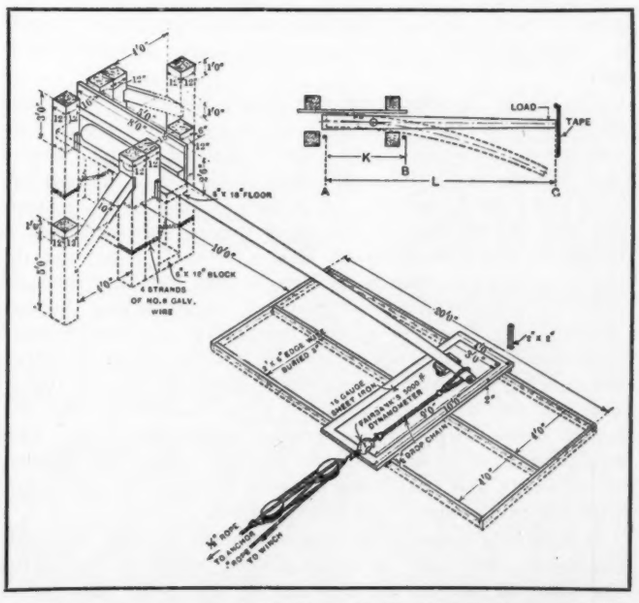

Fig. 10. Isometric Drawing of Testing Equipment.

point, more readily than at any other point, *i. e.*, the unit stress of the most strained fibre would be a constant for any section of the pole. Since the strength of a pole increases as the cube of the diameter, an economical taper would require a pole of a taper that is probably never

reached in practice. For instance, a pole seven in. (17.8 cm.) in diameter at the point of load would require about a 22-in. (55.9 cm.) ground line diameter if the load were applied 30 ft. (9.1 m.) from the ground line. In addition, butt rot is continually reducing the effective taper. Sawn

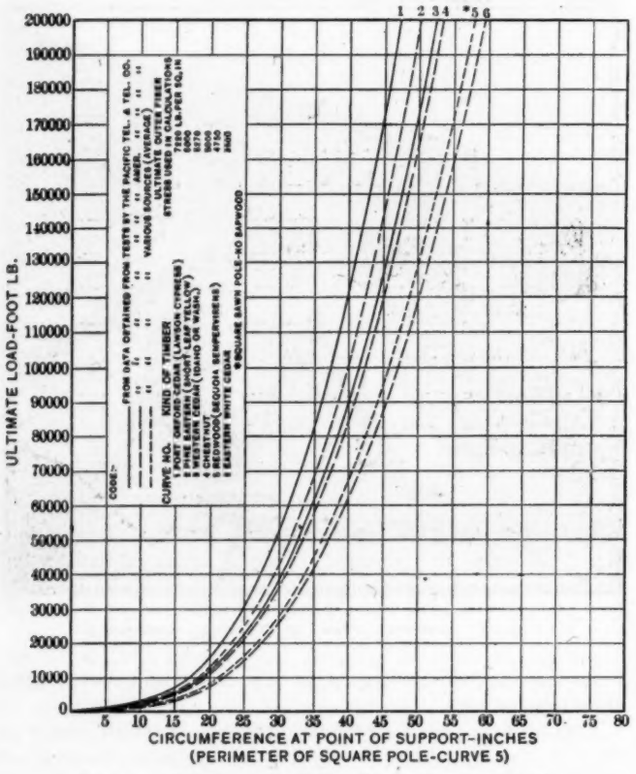
ULTIMATE LOAD-FOOT LB.
CIRCUMFERENCE AT POINT OF SUPPORT-INCHES
(PERIMETER OF SQUARE POLE-CURVE 5)
CURVE NO. KIND OF TIMBER
1 PORT ORFORD CEDAR (LAWSON CYPRESS)
2 PINE, EASTERN (SHORT LEAF YELLOW)
3 WESTERN CEDAR (IDAHO OR RED)
4 CHESTNUT
5 REDWOOD (SEQUOIA SEMPERVIRENS)
6 EASTERN WHITE CEDAR
SQUARE SAWN POLE-NO SAPWOOD

Fig. 11. Comparative Strength of Pole Timbers.

poles have the advantage that any desired taper may be obtained at will, of course, within practical limits.

Pole Spacing.—The spacing of poles varies greatly, and depends principally on the nature of the conductors, degree of exposure to the elements, and the factor of safety desirable.

The above specifications are based on about a 15-year life with a spacing of 130 ft. (39.6 m.) for 60 wires or less, and 120 ft. (36.5 m.) for 61 to 80 wires and on the assumption that the line will be subjected to a wind of 50 miles per hour and a sleet load of ¼ of an inch (6.3 mm.) in thickness and that the conductors are all of the average size used in telephone line construction. If it is desired to increase the life of a line, the span is shortened, thus reducing the load per pole and obviating the necessity of increasing the size of the pole. Because of the increasing cost and relative importance of lines which exceed a capacity of 70 wires, the spacing is reduced from 120 ft. (36.5 m.) for 70 and 80 wires to 100 ft. (30.5 m.) for 70 wires, and 90 ft. (27.4 m.) for 80 wires, where severe weather conditions exist. This has been done to increase the life and reduce the liability to accidents, and thus bring the pole line in cost equilibrium with the remainder of the outside plant.

Where it is desirable to take advantage of local favorable conditions, this may be accomplished either by increasing the span or decreasing the size of the pole. The latter method would involve very little saving outside of the decreased cost of handling poles of lighter weight and the difference in cost of the smaller poles, except where a heavy demand for poles of a larger size would react unfavorably upon the price. The first method, however, presents several advantages, such as the saving of the first cost and erection cost of several poles per mile with the necessary fixtures, and may be adapted to make all portions of a line consistent with the varying degrees of exposure to the elements.

Because of the wide range of weather conditions existing in the Pacific Coast territory, two spacings have been designed, one applicable to localities where severe weather conditions exist and another to regions of mild weather conditions. The considerable saving effected may readily be appreciated by the comparison of the two spacings.

	Ultimate Capacity		
	80 wires	70 wires	60 wires
Severe conditions	90 ft.-27.4 m.	100 ft.-30.5 m.	130 ft.-39.6 m.
Mild conditions..	130 ft.-39.6 m.	155 ft.-47.2 m.	200 ft.-60.9 m.

It must also be understood, that the spacing for mild conditions is less than would be theoretically possible because of other limiting factors, such as greater relative importance of the larger lines, danger of swinging contact of wires and an endeavor to maintain the line in cost equilibrium with the remainder of the outside plant.

Replacement of Poles.—Realizing the importance of uninterrupted service, and the variation of conditions affecting butt rot, a replacement inspection for pole lines has been provided. Although a line is generally designed for a 15-year life, the first inspection takes place eight years after erection and others every three years thereafter. It is the practice to allow the pole to reach approximately a safety factor of one before replacing. However, if the line is considered of unusual importance, or unfavorable conditions exist, a safety factor slightly greater determines the point of replacement. In order to introduce these factors and varying degrees of exposure to which a given line may be subject, replacement tables should be compiled, giving the minimum allowable circumference of sound wood at the ground line. The application of the replacement size necessarily is regulated entirely by the actual load upon the pole and not by the ultimate capacity.

Loads.

Except in lines carrying very heavy circuits, the column load may be disregarded and the lateral wind need only be considered in calculating the pole stresses due to wind loads.

The severity of conditions provided for may not necessarily be the most extreme that long experience has proved possible, as a cost study may prove definitely, for instance, that it may be more economical to assume the risk that the line may be wrecked before its economical life is reached rather than to build it sufficiently strong to withstand the maximum stresses possible over that period of time. In calculating wind loads, added surface exposed to the wind by the accumulation of sleet is one of the most important items to be considered. In order to avoid unnecessary complications, the column load is neglected, the pole and steel-covered conductors considered as circular in section, and the wind as blowing horizontally and at right angles to the lead. Under unusual conditions, the sleet may accumulate to a thickness of two in. (50.8 mm.). However, 0.25 in. (6.3 mm.) of sleet for small conductors and 0.5 in. (12.7 mm.) for large conductors are thought to be conservative amounts for which to provide. Wind velocities may exceed 100 miles (161 km.) per hour. However, a wind of 50 or 60 miles (80.4 or 96.5 km.) per hour is generally the maximum considered.

Two types of weather conditions are considered—severe and mild,—the former governing the territory of probable sleet storms and wind velocities of 50 miles (80.4 km.) per hour or more, and the latter the territory where neither sleet nor winds exceeding 60 miles (96.5 km.) per hour occur. Fig. 12 is a copy of a map which was designed to show, in a general way, the blanket areas in which these conditions are encountered.

Sag of Wires.

The calculation for the sag of wires is based on the equation of the catenary. The fact, however, that the con-

ductor is an elastic material under tension must not be lost sight of when obtaining the result of a change in load. The component forces acting on a wire are the wind horizontally, the weight of the wire and the weight of ice or sleet vertically; the resultant of these represents the total force. The expansion and contraction due to temperature changes must also be considered.

The general practice in calculating sag is to start with the most severe condition thought economical to assume, i. e., maximum sleet, minimum temperature and maximum wind velocity and to assign the safety factor; generally two. The sleet and wind loads are then considered as being released. This release of load reduces the tension in the conductor, which in turn contracts and lessens the sag.

The lessening of the sag again increases the tension and between the two conditions a point of equilibrium is reached. The conductor being now at the minimum temperature, the temperature is assumed to rise, causing the conductor to expand. Here again the tension is released, and the conductor, due to its elasticity, contracts until a second point of equilibrium is reached for the temperature rise assumed. Thus the sag may be determined for any temperature.

With copper or other conductors with a large coefficient of expansion, it is well to obtain the sag at the various temperatures at which it is probable the wires will be strung. With other conductors, it is well to give them the benefit of the doubt by assuming that the maximum temperature exists when stringing.

Cross Arms and Pins.

The majority of the cross arms used in this territory are obtained in the Oregon and Washington territory and are

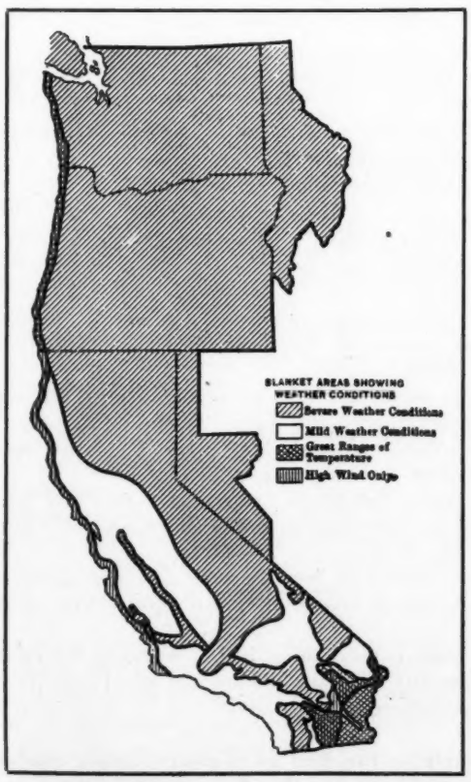

Fig. 12. Map Indicating General Weather Conditions.

sawn from Douglas fir. This timber is cheap, strong and durable when used for this purpose and has been very satisfactory both in the untreated and treated form.

Locust pins are generally used due to their great strength and resistance to decay. However, the supply of this wood is limited, and experiments are being made on other kinds of wood by the government in conjunction with the Pacific Telephone and Telegraph Co. These experiments have not been carried on a sufficient length of time to determine the relative merits of the woods under observation.

Guying.

The problem of guying presents no features peculiar to this territory. The pole lines are designed to stand unassisted under the assumed conditions, and guys are placed either to afford an additional factor of safety or to cope with the local conditions which cannot be foreseen in the broad problem of design.

In general, guys are placed to accomplish one or more of the following purposes:

1. Supporting unbalanced stresses of conductors, due to deadening or change of direction.
2. Balancing loads caused by the attachment of foreign fixtures.
3. Preventing a local break from running each way along the line.

Cases one and two cover the placing of guys to meet unforeseen conditions, and case three affords an additional factor of safety.

Standardization.

During the infancy of the telephone development in the Western states, the first cost was considered the main factor in the design of pole line construction, and the importance of reduction of maintenance cost and the continuity of service was not realized. Now, however, due to the realization of the importance of these factors, a great many of the early construction methods are either obsolete or obsolescent.

Many refinements have been introduced into pole line design which have had an important bearing on the economy of construction and maintenance. Naturally, the larger pole-using companies have been the first to put these practices into effect; but it is to be hoped that all companies will follow their lead, and that a very desirable standardization of materials and methods will result.

Pioneer Bell Assessment Largely Increased.

The Pioneer Telephone Co. has made its report to the auditor's office for assessment for 1912, showing property to the value of $1,283,703.45 in the state. The board of equalization raised this to $6,610,000. The 1911 return was $1,312,464, and that was increased last year to $3,900,000. The gross receipts of the company during the past year were over two million dollars, according to the statement of the company.

The company shows an authorized capital of $10,000,000, of which $4,624,500 has been paid up. Of the 46,245 shares of stock issued, the American Telephone & Telegraph Co. owns 46,089 shares. There are only six Oklahoma stockholders, owning ten shares each.

Charges Bell with Bad Practice at San Francisco.

That the Pacific Telephone & Telegraph Co. has been using flimsy pretexts to dismantle the automatic equipment of the Bay Cities Home Telephone Co., recently purchased, and that the majority of requests by the Pacific company to discontinue Home connections are without foundation, was the report made to Judge Lawler by L. H. Rose, a former employee of the Home company, who has been making investigation for the plaintiff in the injunction suit brought by O. L. Scott against the Pacific Bell. Rose said that he had got in touch with about 90 per cent. of the 675 subscribers whose Home connection the Pacific company desired to discontinue either by order of the subscribers, or on account of delinquency, and that not 10 per cent. of these should be removed.

Thou Shalt Not Steal

Skimmed Milk and Cream—The Telegraph Row—Some Need of Action

By J. C. Kelsey

The Boston News Bureau can usually be expected to step to the front in the defence of the Bell company.

The Postal Telegraph, a magazine devoted to its business says, "What the Boston News Bureau doesn't know about the telegraph business could be written in a large book."

I feel that this should apply also to the telephone. No other magazine has exercised so much partisanship for its divinity, the Bell company, as has the Boston News Bureau.

Yet one is compelled to give the devil his due!

In commenting on the Postal Telegraph Co. the News Bureau says that the Postal "has secured the cream and avoided the skimmed milk." For once I feel that the divinely-inspired Bureau has hit it right.

The Postal's magazine makes a fatal mistake of admitting the charge by saying, "all of which is complimentary to the acumen of the Postal."

It is merely human nature to take the line of least resistance. There is no acumen about it, nor is it complimentary. Far from it.

I can account for the slowness of the Postal Telegraph Co. to take full advantage of the Independent telephone interests by the very fact that it has been too well satisfied with the cream, and has too cordially despised skimmed milk.

When a concern has limited itself to rich fields only, it is entitled to no sympathy whatever when an evading enemy gets to creeping in close to the cream.

I am not in love with the Western Union Telegraph Co. I have had fearful and awful luck with messages sent over its lines. It owes me at least a million dollars for mental anguish. Yet I must admit that "the principle of serving all the people everywhere" has merit, at least telegraphically.

While it is all true that the Western Union has made monkeys of the railroads, the fact remains that it covers the territory.

It is inconceivable that the railroads should be so helpless. But today they have even submitted to the yoke of telephone apparatus and connections, exclusively Bell.

The railroads are so poor that they can not pay for two telephones, and usually demand the Independent instrument free, because they think they can get away with it.

In this connection, I would advise every Independent telephone man who has a free railroad telephone, to make the service one way. Let your patrons call the railway, but stop the railway from calling your subscriber list. Then you will hear a yell!

At Terre Haute, Indiana, the poor old Pennsylvania Railroad feels the pinch of poverty so much, that upon being compelled to pay for Independent service, it has cut its service down to two telephones.

I would advise Terre Haute Independents to refuse to give the Pennsylvania even the two telephones,

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But although the Western Union has the railroads trussed and tied, it has them just the same! There is little or no excuse for the Postal being compelled to use Western Union wires.

Today, I can't send a telegram to Grand Forks, Fargo or Bismark over Postal wires. Yet the magnificent lines of the Tri-State Telephone & Telegraph Co. are available. And the North Dakota Independent Telephone Co. could have given it connection all over North Dakota and Montana.

It strikes me that the big noise should be stopped, and the Postal should get busy with the means right under its thumb.

It is all right to have $12,000,000 reserves, but even these are not to be wasted.

Any management, under the present opportunities, that would fall back upon these reserves, should be severely handled by the stockholders.

Even a child knows that the merger of Western Union and Bell will work out mischief to the Postal. I have a friend in Providence, R. I., who simply is unable to get the Postal offices from his monopoly telephone. And the Postal magazine itself gives dozens of specific cases, all of them as rank an injustice as you can imagine.

And if you read the Postal Magazine you will find that these specific cases are in the East, in the territorial cream!

It is a bold enemy that attacks the cream at the outset. Usually, there is guerilla warfare in the sparsely settled districts first.

But in Brooklyn, for instance, we have a specific case of a man calling the Postal being asked to put a nickel in the box and then getting Western Union.

It would certainly be found true that this same condition prevails elsewhere.

But what is principally wrong about it? What did the Bell buy control of Western Union for? Merely to create a wire trust.

And so surely are they of accomplishing this wire trust, they have captured the word "Telegram." Today, the code word of Western Union is "Telegram." How natural! A case of New York nerve purely!

The Postal Telegraph Co. seems to feel that it can make progress by appealing to the people's sense of justice. That is absurdly futile.

It also seems to feel that the law can make the Bell-Western Union combination be good. Not in this generation!

The most natural thing in the world is the effort of the Bell company to make it hard for the Postal to originate business—where it hurts most.

Nowhere in the Bell or Western Union charter have I ever been able to find that they are philanthropic or charitable, or anywhere but merely organized for profit.

Nowhere have I seen any one make progress by being nice and lamb-like before Bell attacks. And, most of all, the Bell-Western Union Telegraph combination recognizes no creed but its own necessity.

There never was a more mistaken notion than differentiating between cream and skim milk territory. So many Independent companies failed to take advantage of their position by confining their service to so-called "cream" territories.

No one for a moment would justify a city with a waterworks system in refusing to supply water anywhere within the city limits, where there was reasonable need.

Nor a monopoly gas company like our Chicago company. They are compelled by public policy to extend their pipes where there is a reasonable need.

The power monopoly in Chicago does not need force to compel its extensions. It realizes that it has a corporate conscience.

The Bell company got its artistic whipping from the public because it refused to go beyond the cream districts. A farmer could not have a telephone for a gold mine. He merely was a victim of the cream habit.

Today, everyone jumps to the call of a farmer for telephone service.

The Bell company has learned its bitter lesson. It has nicely concealed its stripes and welts and should be more careful in the future about skimmed milk territory.

The Postal Telegraph Co. will have to learn the same lesson, if it does not take advantage of the Independent telephone opportunity given it today.

It had better wipe out that $12,000,000 surplus in building defenses, before the invading enemy demands it all for indemnity.

France got pretty corrupt a few years ago. She sent her soldiers out to fight Germany with sand in their cartridges instead of powder. Merely because there was great graft extant.

To enable a few people to make unusual profits, the road to Paris was made easy for Bismarck and it cost $3,000,000,000.

It does no good to sit back and cry. No Jupiter will come out of the water with a golden ax.

I say for the Postal Telegraph Co., that its magazine is not enough to resist the onslaught of the Western Union. Even the Bell company has recognized the advantage of conciliating Independent properties.

It is willing to buy, sell or merge. Surely that is fair, on the face of it, and for one lone reason of depriving the Postal Telegraph Co. of a natural ally.

Before this unification campaign ever began, the Independent leaders fairly begged the Postal to come in and fortify themselves.

Had it done so then, the Postal would today have had a practical monopoly of telegraphic advantage west of the Hudson river, to offset the Eastern advantage. But it did not heed!

No one is trying to give the Postal any gratuitous advice, as the Boston News Bureau did. I certainly do dislike to say a word about the Postal matter. But so many correspondents of TELEPHONY have protested about it that I am compelled to call for a show-down.

If the Postal Telegraph Co. is a real friend of Independent telephony, we want to know it by deeds and not words.

We all appreciate the great good that this telegraph company wrought. In fact, it made the Western Union!

That old company was so mixed up that it was good for nothing—a merely insane organization. You could pay for messages and never hear from them again.

I am still waiting for a message I paid for at St. Joseph, Missouri, in 1903. But today it has improved.

We owe a big debt to the Postal Telegraph Co., and we criticize their torpidity with more sorrow than anger. But I want to dispel any notion that we are blindly applauding the Postal or any one else.

No concern can exist on applause. The public is fickle—they are but children. When someone says the public won't allow a thing to be done, it makes me laugh.

The public gets credit for preventing things which really belongs to courageous men who have a sense of justice, and who will make a fight.

George Kindel, of Denver, fought freight rate discrimination against Colorado for twenty years. The public thought he was a crank. Yet he won out and the dear people get the credit!

It is common sense to go to work and help yourself and not depend upon sentiment in this world. That is why we beg the Postal Telegraph to get busy and save itself. We need this concern in spite of their dilatory tactics.

Rip Van Winkle slept twenty years, because there were no kindly friends to wake him up before that time.

From what I can see, the Postal Telegraph Co. is still calmly sleeping, as far as material activity is concerned.

"Thou shalt not steal" has been handed down a long time. And a thief, in the long run, usually suffers more from his acts than the one who loses his property.

But the whole case reminds me of Judge Murphy, a municipal judge in St. Louis, way back in the troublesome times of 1893. A thief grabbed a pocket-book from a woman, but was caught.

Judge Murphy discharged the thief because he held that tha woman unwisely tempted him to steal and was really herself to blame.

I feel that the Postal Telegraph Co. will have a hard time to convict the Bell-Western Union unless it makes the thievery a little more difficult.

As it exists today, the temptation to the Bell-Western Union crowd is so great that one can not blame them for stealing all the business they can get away with.

The Postal can make it harder by going into telephone matters seriously.

Really, I gave up the Postal Telegraph Co. as hopeless from our telephone standpoint, when it appointed a telegraph man as superintendent of telephone service. And it made a great noise about it, too.

The fact remains that the Western Union gross receipts are increasing. As Mr. Cleveland said: "It's a condition, not a theory" confronting our Postal friends.

We hesitate to give advice, as we do not care to get placed in the same class with the Boston News Bureau. We can only hope that our words of warning will not be misunderstood. We are still with the Postal at heart. But I am not going to be fooled by words. Give me deeds!

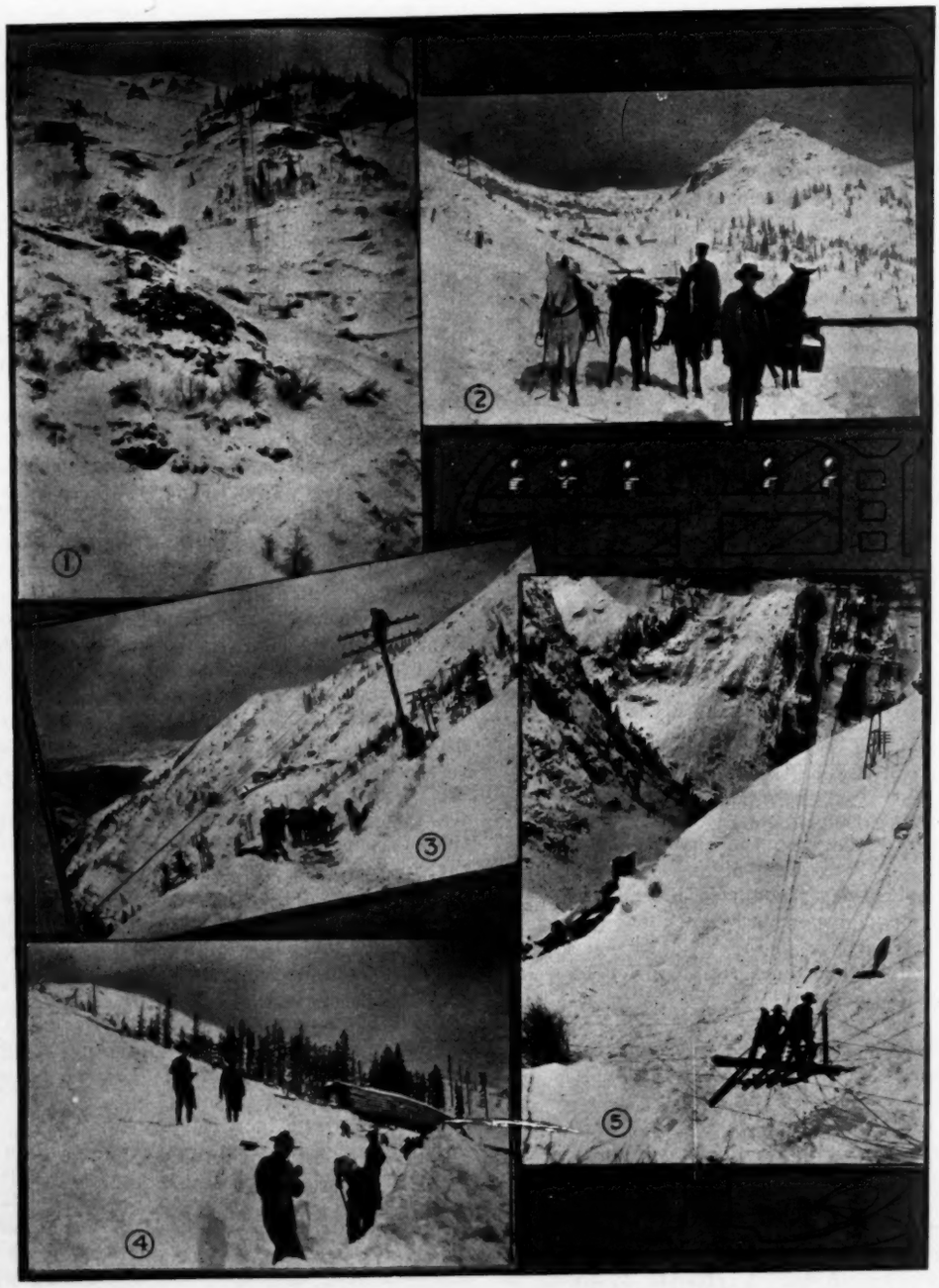
MORAL—Stealing sometimes seems to be justified.

Hearing in La Crosse Case Indefinitely Postponed.

Owing to illness in the family of one of the attorneys representing interests involved in the La Crosse interconnection case, the hearing before the Wisconsin Railroad Commission has been indefinitely postponed.

Telephone Maintenance Perils in High Altitudes

The difficulties and dangers of maintaining telephone lines in the mountains in winter is not appreciated by telephone men residing in comparatively level countries. The May issue of the Mountain States Monitor contained an article by W. D. Morrison of Montrose, Colorado, telling of the dangers from snow slides in the mountains. Through the courtesy of the Monitor the illustrations are reproduced in connection with abstracts from the article.



The Repairing of Telephone Lines in the Mountains of Colorado in Winter is Accomplished Quickly in Spite of Danger From Snow Slides.

With November, 1911, started the first snowstorms in the mountain ranges surrounding Telluride. The high basins received a fall of about four feet, which was crusted by the intense cold afterward, and the little snows that followed during the three succeeding months remained as they fell. That left the hillsides glazed over, and when the heavy snow of the first week of March came and piled up, snow slides were inevitable. And they certainly came.

Monday, March 4, the entire hillside on the Rio Grande Southern, from the high bridge at Ames almost to Butterfly switch near Ophir loop, a distance of half a mile, slid. No Durango train has been seen in this city since on account of it.

On the same afternoon the Fairview slide, near Nellie Mine, ran and caught George Hall on the trail and carried him a distance of 600 feet down the mountain side. He was rolled end over end, and finally landed in a tree and buried to his chin in the snow. His men, who had narrowly escaped the slide, assisted him out and he luckily received only temporary injuries.

About the same time a slide ran across the Alta road in Gold King basin and caught the mail wagon, in which were the mail carrier, J. E. Walker, and John M. Wagoner, manager of the Alta mine. Both men were covered pretty nearly up to their heads and one horse knocked off the road. Road Overseer Jim Boyer and his helper, Sam O'Neil, happened to be near and were both caught in the slide, but escaped uninjured.

The next day was a repetition of troubles with snow slides. The Big Elephant slide ran over the Tomboy electric surface tram and took out 400 feet of track sheds, together with the Telluride Power Company's power line and towers, and knocked out five poles and 600 feet of telephone circuit. Foreman Dick Cassel of the power company and exchange manager W. D. Kauffman of the telephone company were on the ground early and had emergency cable, which was taken to the scene on pack horses, working over the break by noon. The same evening the telephone toll lines were cut off by a slide over the top of the range at Camp Bird mine, and this cut off telephone connection with the outside world except and alone Norwood, which was not in the slide country and was undamaged.

On March 6 a slide came down in the vicinity of Pulaski mill and took out the Smuggler power line and the telephone line to the Lewis mine. It came off the top of Mount Ballard and dammed Bridal Veil creek. Frank Thomas of the Smuggler power line was returning from the scene Thursday.

When near Bridal Veil falls a slide broke but as he was at the top of the slide, it carried him only a few feet, when he succeeded in clinging to a rock and the slide went on down the mountain. Mr. Thomas considers himself very lucky.

On the same day the entire hillside on Boomerang hill slid and took out six telephone poles into the Nellie mine.

On March 9 slides ran at Gold King basin, Liberty Bell mine and Bear creek. Sunday the 10th, at 3 a. m., the Bob Tail ran, taking out two towers of the Smuggler Union tramway and burying the Pennsylvania tunnel tramway. It took about two weeks to repair the trams.

Previous years the telephone company has found it necessary to rebuild the toll line past this slide after each run. Luckily this time the slide only shorted the No. 6 iron circuit and was soon repaired by the local trouble men. The toll line, being on the opposite side of the canyon, is never reached by the slide of snow, but has always been torn out by the concussion of the slide. The escape of Sunday probably is due to the fact that the construction gang, under supervision of Mr. Daily, took special precaution in the rebuilding and guying of the toll lead at this place last fall.

At 1:30 p. m. the Ajax slide ran, taking out the Black Bear terminal and the telephone line to their mine, also the telephone line to the Lewis mine. Monday, March 11, the Valley View and Pandora slides were shot by road overseer James Fields at 3 p. m. These slides were expected to run at any time on account of the continued fall of snow and danger of disaster was increasing day by day.

Cartridges of dynamite placed near the crest of the mountain down which these slides run were exploded simultaneously. The effect was that both slides ran from the crest to the bottom of the gulch. The concussion caused the Oriental slide to run an instant later. This slide did some damage, carrying out six poles in the heavy telephone lead at this point and a power crossing protection which will cost $400 to replace.

On the night of the 13th a slide ran above the Black Bear boarding house and struck the building without a moment's warning. Fifteen men were in the building when the crash came. Seven escaped without injuries, while five others suffered either broken ribs or limbs. Three were killed. A terrible experience is told by the survivors and the destruction of the building was remarkable, as it was far from the mountain side down which the slide ran, and the intervening land was so nearly level that it is claimed the slide at the base of the mountain must have been at least a thousand feet deep to have sloughed far enough to reach the boarding house. No snow from any previous slide has ever before reached the mill or boarding house.

By veterans of the camp it is claimed that this winter has been the worst for slides the camp has ever known, and slides have run which were never known to run before. Telephone lines were soon put in working order, although in several places permanent repairs will not be made for two or three months.

The illustrations show scenes along the mountain telephone lines. In the first view a 140-foot span at the Pandora slide is shown. The second was taken at the place where the Big Elephant slide came down while the third view shows the installation of the emergency cable by means of which the break in the telephone circuit was repaired. The fourth view shows the men clearing out the road after a slide. In the fifth scene is shown the remains of a $400 protected power lead crossing of the telephone lines at the Pandora slide near Telluride, Colorado.

Extensions to England's Telephone Systems.

At the annual dinner of the London Chamber of Commerce, the postmaster-general stated that during the last six months it had been found that in 50,000 telephone calls, the period occupied from the time of the ring to the time of the answer was 5.1 seconds. The average time in making the connection was 28.6 seconds, or less than half a minute. Recently there was issued to the officials throughout the country, instructions which it is hoped will help to improve the service.

This year it is proposed to spend on the development of the telephone service throughout the country, apart altogether from the money to be paid to the National Telephone Co., two and one-half million pounds on the trunk system and the London and provincial systems. Steps are also being taken to introduce automatic telephone equipment in two or three of the larger towns.

Illinois Clearing House Annual Meeting.

Arrangements have been made by the officers of the Independent Toll Clearing Co., the Illinois clearing house, to hold the annual meeting at their offices in Springfield, on May 21 and 22, commencing at 8 p. m. on the evening of the twenty-first. An elaborate program has been arranged. Judge L. Y. Sherman, Republican candidate for United States Senator, will speak on the employer's liability law as seen from the law makers' standpoint. C. G. Alexander, of Chicago, will speak on the same subject as seen from an insurance man's standpoint. After this there will be an open discussion on the topic: "Shall Illinois Telephone Men Carry Their Own Risks?"

On the following day W. S. Vivian, manager of the Michigan Clearing House, will talk on clearing house subjects and will conduct a school for toll operators. The election of officers will also take place on the second day of the meeting.

On the second day's program these other topics will be discussed: "The New Illinois Toll Lines," by Charles H. Hood, Aurora; "The Illinois Clearing House," by H. B. Gilmore, manager Toll Clearing Co., Springfield; "How May the Operator Make Herself of More Value to Employers and Patrons?" by Miss Barnes, Bloomington.

It is very desirable that managers who are not yet members of the clearing house should attend this meeting and that they bring their toll operators with them for the meeting on Wednesday, as the talks by Mr. Vivian will be of great practical value to every one.

Mr. Gilmore, manager of the clearing house, states that the organization is now solidly on its feet and that it has been showing a satisfactory profit over running expenses for the past five months. He particularly urges that those who have not yet joined attend this meeting. The advantages of membership which will be there made plain are so great that there can be no reasonable excuse for longer remaining outside. Also the talks and discussions will be of practical benefit to every telephone man in the state, whether member or not.

The clearing house has moved into new and larger quarters, and is now situated at 309½ South Sixth street. On account of the growth of the company it was thought desirable to find new offices.

A Curiously Complicated Case.

The New York Court of Appeals handed down a decision recently affirming a judgment of $32,000 held by the estate of John Dunfee against the Empire State Surety Co. The decision practically closes the litigation growing out of the suit of Florence Ryan against the Central New York Telephone Co. Miss Ryan was hurt by falling into a trench in front of the Carnegie Library six years ago, receiving injuries which made her insane. She was given a verdict of $20,000, which was reduced by Justice William S. Andrews to $15,000. The telephone company then sued the John Dunfee estate, under a sub-contract, which held the estate liable

for accidents in connection with the digging of the subway system in Montgomery street. It was successful in its suit. The Dunfee estate then sued the surety company on a liability bond and was given a verdict which has now been upheld.

Sue to Prevent San Francisco Merger.

Action to prevent the merger of the system of the Bay Cities Home Telephone Co. with that of the Pacific Bell has been begun with the filing of two suits.

The first comes from the office of U. S. Webb, attorney general, on complaint of Daniel S. O'Brien, a taxpayer. The second was prepared by City Attorney Percy V. Long. Both cover practically the same ground.

The suit from the attorney general asks that the transfer of the Home Telephone plant made by its successor, the Bay Cities company, to the Home Long Distance Telephone Co., be declared void, on the ground that it was a part of the same transaction whereby the Pacific concern came into possession of the property. The legal ground of the prayer is the provisions of the ordinance granting the Home franchise, which specifically sought to bar the sale, not only of the franchise and the joint fixing of rates, but the selling of the poles, wires, conduits and other necessary apparatus necessary to the conduct of a system.

The Pacific Telephone & Telegraph Co., defendant, will accordingly be asked to show by what right it is operating the system acquired from the Home's successor, the Home Long Distance prior to March 15, when the present de facto merger went into effect.

The court is asked to adjudge the Pacific States company as "usurping and intruding" under a franchise not belonging to it—which franchise was specifically excluded from the transfers made by the Bay Cities to its successor. Attention is called to the provision of the granting ordinance, passed October 3, 1906, forbidding the sale or transference of the franchise to any other company then doing a telephone business in this city, without the consent of the supervisors. And on the ground that this provision has been violated the petitioner asks that the franchise be declared forfeited. The complaint of the city attorney also recites the history of the telephone situation in San Francisco. But while the attorney general's complaint demands the imposition of a $5,000 fine, in addition to forfeiture of the Home franchise, the second seeks only the setting aside of the transfers by the Bay Cities to the long distance company and the Bell an injunction restraining the Pacific company from exercising any rights claimed to have been derived through the purported sales of the Home plant.

City Attorney Long asserts in his complaint that San Francisco has been deprived of bona fide competition in the telephone business by the de facto merger of the two systems.

Appropriates $5,000 for Chicago Investigation.

By action of the Chicago city council a fund of $5,000 has been made available for the use of the committee on gas, oil and electric light in investigating the status of the telephone branch of the business of the Illinois Tunnel Co. The question at issue is whether or not the company had 20,000 stations in operation on June 1, last, in accordance with the provisions of its franchise.

Would Test Bell's Rights in Denver.

Application has been made to District Attorney Willis V. Elliott, of Denver, Colo., by Omar Garwood, attorney, to bring a quo warranto proceeding against the Mountain States Telephone & Telegraph Co. The claim is made by Mr. Garwood, and those for whom he is acting, that the telephone company is occupying the streets of Denver without authority of law. Mr. Garwood has stated to the district attorney that, if he does not act, he, Garwood, will. Any taxpayer may proceed in case the officers fail to do so.

The Chamber of Commerce has followed the example of the Real Estate Exchange and has gone on record by a practically unanimous vote demanding that the telephone company make substantial reductions to all users of telephones in Denver. The committee reported that the company has no franchise rights in the city, and gave the opinion of the legal committee to the effect that it cannot operate without such rights except by the sufferance of the city officials and the people.

Extension Granted Indianapolis Company.

The Indianapolis Telephone Co. has been granted, by the Board of Public Works, an extension of four months from July 1 for the installation of a new switchboard and for making other improvements required by the company's franchise. The extension was granted on the supposition that the plans for the proposed merger of the two companies would still be pending July 1.

Several months ago the board ordered the company to install a switchboard not later than July 1. In the meantime the proposed merger came up and an extension was asked until the merger proposition was definitely settled. The action of the company in obtaining an extension indicates, it is said, that the company will make every effort to consummate the unification plans before November 1.

Louisville Loses One Suit Against Bell.

One bit of litigation which has continued for the past three years between the municipal authorities of Louisville, Ky., and the Cumberland Telephone & Telegraph Co. terminated a few days ago when the Supreme Court of the United States, at Washington, affirmed the action of the Federal District Court for Western Kentucky in permanently enjoining the city of Louisville from removing the equipment of the telephone company from its streets. Justice Lamar delivered the opinion, which was brief. This decision, however, does not affect the rate case which the municipal authorities have instituted against the Cumberland and which is still on the supreme court docket.

The opinion of Justice Lamar holds that the grant made by the state of Kentucky and the city of Louisville to the old Ohio Valley Telephone Co. and subsequently transferred to the Cumberland Telephone & Telegraph Co. when the latter took over the Ohio Valley concern, may not be annulled through the instrument of a city ordinance. The opinion states that the authorities submitted did not prove sufficiently sound to support the contention that the city may withdraw the right to use its streets.

The differences between the Cumberland company and the city arose in 1909, when the council passed two ordinances, one of which revoked the company's franchise and ordered the company to purchase a new franchise or else get out of the city. This is the measure which has just been finally adjudicated.

The rate ordinance is still before the supreme court. This cut the Bell rates from $7.50 to $5.50 per month for straight business service; from $5.50 to $4 per month for party business service; from $3.50 to 3 per month for straight residence service and from $2.50 to $2 per month for party residence service.

Concrete Telephone Booths.

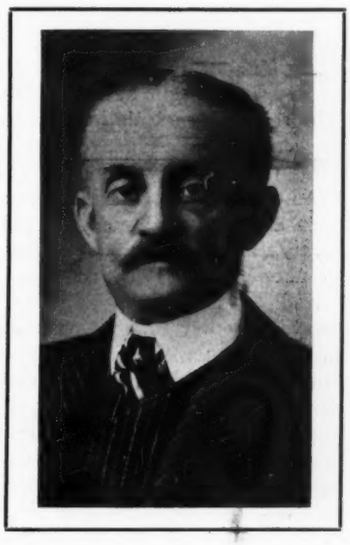
According to newspaper reports, the Baltimore & Ohio Southwestern Railroad Co. introduced a novelty in telephone booths along its line between Louisville, Ky., and North Vernon. It has installed concrete telephone booths, each weighing about 4,000 pounds, and made of solid concrete. Telephone wires are to be strung to the booths and trainmen will be able to get in touch with operators from any point of the line.

A Quartet of Men Prominent in the Telephone Field

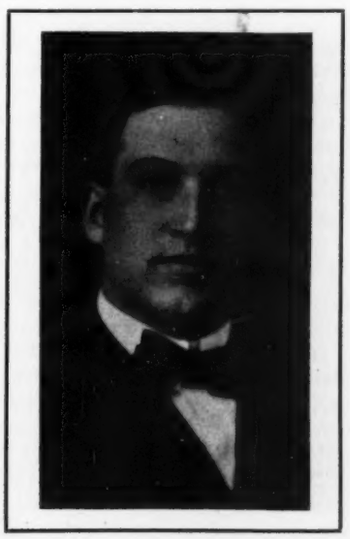
HERBERT RALPH RISLEY, general manager of all the companies in Montana owned or controlled by the interstate Consolidated Telephone Co., of Spokane, Wash., began his career in the telephone business at Jamestown, N. Y., in 1905, when, after being employed in various capacities about the plant, he took active charge of contracts and collections. He was later manager of the Meadville, Pa. company. He removed to Butte, Mont., in 1909, eventually holding the position of superintendent of the Independent companies in the state until 1912, when he was made general manager. Mr. Risley was born in Ellington, N. Y., January 25, 1880, and was educated in the public schools of Kennedy and Jamestown, N. Y. His principal work has been the development of the Independent movement in Montana, under the direction of T. S. Lane, president of the Interstate Consolidated. He brought Butte in six years from 225 stations to upwards of 6,000, as against some 1,000 Bell instruments in operation at the beginning of 1912. His duties were gradually increased to include charge of the entire state.

GEORGE W. BROWN, secretary and treasurer of the Chicago Telephone Supply Co., of Elkhart, Indiana, was born in Cheyenne, Wyoming, December 28, 1867. He received his education in the public schools of Omaha and Superior, Nebraska. From 1895 to 1900 Mr. Brown was associated with Armour & Co., the big packing and provision corporation, being in charge of that company's business at Denver, Colorado. During the next three years he was engaged in general business pursuits at Leadville, Colorado. In August, 1903, he entered the employ of the Chicago Telephone Supply Co. and devoted himself to a thorough and comprehensive study of the telephone business from the manufacturer's standpoint. In 1907, he was made secretary and treasurer of the company. Mr. Brown has interested himself particularly in the financial, executive and sales branches of the business, while not neglecting the development of new ideas and the perfecting of the Chicago Telephone Company's apparatus and equipment. He is a member of the Masonic order and is an Elk.

WILLIAM C. STERLING, president of W. C. Sterling & Son Co., Monroe, Mich., of the Sterling Cedar Lbr. Co. and other concerns, both in Monroe and elsewhere, was born in Monroe September 17, 1849, and educated in the Notre Dame University there. The lumber and cedar business, in which Mr. Sterling is prominent, was established by his father in 1848. One of the oldest and largest firms continuously in the business it has made shipments as far as Cairo, Egypt, and Brazil, South America. Mr. Sterling's business activities include the water company, banking, wholesale and retail ice and coal, manufacturing plants, etc. He has also been interested at different times in telephone operating and manufacturing companies. Mr. Sterling is a genuine sportsman, is a member of one of the largest duck clubs in the country, backer of a rowing crew which broke the world'srecord, vice-commodore of Inter-Lake Yachting Assn., several times commodore of Monroe Yacht Club. Among the clubs of which he is a member are the Detroit Club, O. L. Club, Monroe Marsh Club and Monroe Yacht Club.



FLOYD N. DULL, secretary of the Home Telephone Co. of Michigan, at Detroit, and purchasing agent for both the Home and the Interstate Long Distance Telephone Co., ended his schooling and began his business career at the age of eleven. He was born in Toledo, Ohio, December 17, 1883. In 1894 he went with the Kirk Mfg. Co., bicycle manufacturers, remaining as messenger, clerk and stenographer until October, 1900, when he associated himself with Barber & Brailey as secretary. He was with them during the construction of the systems at Toledo, Louisville, Kansas City, Utica, and other cities, maintaining this connection, with a short intermission when he went to Colorado for his health, until 1909. From July, 1907, to January, 1909, Mr. Dull was secretary to the president of the Toledo Home Telephone Co. and its purchasing agent. He has been with the Detroit Home since the latter date. Mr. Dull is a Knight Pythias and a member of the Adcraft Club, the Rotary Club and the Detroit Wholesalers and Manufacturers' Association.



Cases and Discussions Concerning Public Relations

This Department Has Been Established as a Regular Weekly Review of Proceedings Before Courts, Commissions or Civic Bodies—Communications Relating to This Branch of Work are Invited from All Persons Interested in Past Cases, or Those to be Heard in the Future

Wisconsin Commission Orders Physical Connection.

The Wisconsin Railroad Commission this week issued its first order requiring two Independent telephone companies to establish physical connection between their lines. The order was issued under a law passed at the last regular session of the legislature which empowers the state railroad commission to compel physical connection between the lines of different companies whenever it deems public service and convenience require it.

The order just issued was made on the application of the Linzy-Brook Telephone Association of Underhill, Oconto County, and is directed against the Cecil-Green Valley Telephone Co. of Cecil, Shawano County. Both companies desired to connect their lines, but the Cecil company refused to enter into an agreement, as it was feared if it did so that the Wisconsin Telephone Co. would cancel its contract with it for long distance service and sever its wire connection. The railroad commission said in its ruling on the matter that if the Wisconsin company canceled its contract with the Cecil company, the latter could file a complaint with the commission. It would then investigate the situation and if it was found that public service required a renewal of the connection it would order such connection.

The Wisconsin company is preparing to fight out the question of physical connection in a case from the city of La Crosse now pending before the commission. The first hearing in that case will be held the middle of June. If the commission rules against the Wisconsin company, the matter will probably be carried into the courts for settlement. The Wisconsin company claims in brief that it is practical confiscation of its property to require it to give the service of its expensive long distance lines to the smaller companies of the state.

Wisconsin Commission Grants Rate Increase.

The Wisconsin Railroad Commission, on application of the Plymouth Telephone Co., of Plymouth, has permitted that company to increase its rates. Business rates have been advanced fro $1.75 to $2 per month and residence rates from $1.10 to $1.50. The commission made a valuation of the plant and will compel the company to adopt its system of bookkeeping.

California Commission Orders All Rates Restored.

In a general order sent out by the Railroad Commission, of California, all public utility corporations which have raised their rates since October 10, 1911, are ordered to immediately restore the rates existing at that time.

In a statement issued to the press the commission explains that certain public utilities, particularly telephones, gas, electric and power companies, have increased rates since October 10, 1911, contrary to the provisions of the public utilities act.

The general order does not affect any incorporated district, rates therein being fixed by municipal boards over which the commission has no jurisdiction. It, however, applies to all public service corporations in unincorporated territory, all telephone toll rates, and all telephone exchange rates, in so far as the exchange or suburban service connected therewith covers districts outside the limits of an incorporated city or town.

The provision fixing October 10, 1911, as the date at which the act was effective was inserted in the public utilities law to prevent companies from raising their rates before the commission assumed jurisdiction.

Asks California Commission to Force Connection.

At a meeting of the directors of the Tehama County Telephone Co., at Red Bluff, Cal., recently, a resolution was passed, instructing H. P. Andrews, attorney for the company, to file complaint with the state Railroad Commission against the Pacific Telephone & Telegraph Co., requiring the latter to make long distance connection with the Tehama County company at Red Bluff and Corning.

This procedure is under the provisions of the public utilities bill passed at the special session of the legislature, and will be the first complaint of that nature filed with the commission.

The Tehama County Telephone Company is an Independent concern doing business in competition with the Pacific company throughout Tehama county, but having no long distance connections out of the county except in Glenn county, where connection is made with Glenn County Telephone Co., another Independent organization.

Authorizes Additional Charge for Desk Set.

The Nebraska Railway Commission has authorized the Southeast Telephone Co., of Falls City, to charge twenty-five cents more per month for desk than for wall telephones. The company contended that it costs more to maintain a desk telephone because the covered wires are liable to become detached or worn out and that the instruments are often broken by falling on the floor.

McCook, Nebraska, Case Before Commission.

The complaint of the city of Cook against the Nebraska Telephone Co. has come before the states Railway Commission. A reduction of 33 1-3 per cent. in the telephone rates charged by the company at McCook is asked. The company filed a printed brief but this was found to be full of errors and will have to be reprinted before it is given publicity. The company also filed a physical valuation of its exchange at McCook and also at Culbertson. The commission decided to hear testimony in the case June 7 and in the meantime the commission's engineers will check the property values reported by the company.

Washington Commission Orders Physical Connection.

In a recent order the Washington state Public Service Commission directs a physical connection between the Benton County Independent Telephone Co. and the Sunnyside Telephone Co. at Grandview, in Yakima county, within thirty days, so that messages may be transferred between the patrons of both lines.

This order is the first of its kind, directing physical connection of telephone lines, since telephones were placed under the direction of the commission, and it is of great interest throughout the state. The commission in its findings states that there is a contract existing between the Pacific Telephone & Telegraph Co. and the Benton County company, entered into October 1, 1909, which precluded the latter company from making physical connection with the Sunnyside company, but the commission says in its order that the connection is desired as a public necessity and must therefore be made. Joint rates and charges for the double service will be put forward shortly.

The commission in concluding says it "does not undertake to pass upon or adjudicate the contract relations nor the rights of both companies under the contract," but finds "that the public necessity and interest are superior and paramount and demand and require the said connection at Grandview."

Commission Denies Right to Sell to Bell.

Because the price fixed was too low, the Public Service Commission, of Ohio, has denied the application of the Citizens Telephone Co., of Delaware, for permission to sell its plant to the Central Union Bell. The two companies, however, are granted the right to connect and interchange service.

Furchase and Sale in Ohio.

The Adams County Telephone Co. has asked the Public Utilities Commission for permission to buy the exchanges of the Central Union Telephone Co., at West Union and Seaman, Ohio, for $3,064. The Central Union company asks permission to buy the Winchester exchange, of the Adams County company, for $2,350.

Brief Filed Against Bell in Camden, N. J.

The merchants of Camden, N. J., through Gaskill & Gaskill, attorneys, have filed a brief with the state Public Utility Commission, complaining that the rates of the Bell company in that city are extortionate and its service inadequate. The brief is voluminous, going into detail on every point.

New Jersey Commission Permits Rate Increase.

Following a public hearing held last month, the New Jersey Board of Public Utility Commissioners has approved a proposed increase in the rates charged by the Farmers' Co., which operates in Bordentown and vicinity. The increase permitted by the board is from $20 to $24 a year for party line business service. The charge of $20 a year for party line residence service is to remain as now established. The present rate is $20 a year for each class of service.

The board has ordered a complete schedule of rates filed within six months and also the preparation of a map of the district served. The Farmers' company, years ago, took over the Bell lines in its territory.

Recent Rulings of Kansas Commission.

The Public Utilities Commission, of Kansas, has recently granted the Salina Telephone Co., of Salina, Kans., the right to purchase certain toll lines of the United Telephone Co., of Abilene, and the property and franchises of the Plainville Telephone Co., of Plainville.

In the matter of an application of the Missouri & Kansas Telephone Co. for permission to raise its rates in Grantville, the commission declined to grant the appeal, declaring that the prevailing rates were sufficiently high to be remunerative.

A request of the Whitewater Telephone Co. that the Missouri Pacific Railroad be compelled to install and pay rental for telephones in its offices in Brainerd and McLain was denied, on the ground that reasonably adequate telephone service was already provided the people of those towns, which is all that is required by the statute.

Kansas Commission Insists on Railway Telephones.

The Kansas Public Utilities Commission has issued an order prohibiting railroad companies from ordering telephones out of their stations and prohibiting telephone companies from taking them out. Free service is prohibited and the railroads must not only retain the service but pay for it.

Hearing Before New Hampshire Commission.

The New Hampshire Public Service Commission will hold a hearing May 27 on a petition before it filed by the Coos Telephone Co. and J. H. Dudley for approval of a contract covering the purchase and sale of the plant, property and franchises of the Colebrook, Columbia & Errol Telephone Co. The hearing will be at Concord.

Indiana Telephone Convention at Indianapolis

Seventh Annual Meeting Endorses Plan for Unification of Indianapolis Telephone Companies Under Independent Franchise

The Indiana Independent Telephone Association held its annual convention at the Claypool Hotel, Indianapolis, May 15 and 16, and was marked by a good attendance and keen interest in the proceedings. The well known Independent wheelhorses of the state were on the job and succeeded in securing the adoption of their programme, which included the passage of a resolution recommending the unification of the two telephone companies in Indianapolis under the Independent franchise, and guaranteeing connection facilities to all outside Independent companies in the state seeking toll lines to and from the capital. Judge N. G. Hunter, Manford Savage and other Independent leaders believed this the course to pursue.

The resolution, which was adopted late Thursday, will be printed in full in next week's issue of TELEPHONY, together with the addresses of President Hunter and Manford Savage, president of the National Independent Telephone Association.

The officers of the Indiana association elected were: President, N. G. Hunter, Wabash; secretary-treasurer, Walter J. Uhl, Logansport; executive committee: Hart Farwell, T. E. Bohn, J. A. Browne, F. R. Parrott.

At the Thursday morning session in his address President Hunter strongly advocated that the association endorse a merger of the Indianapolis telephone companies under the Independent franchise, the outside telephone companies being fully protected by clause 10 in the ordinance passed July 6th, 1908, granting a franchise to the Indianapolis Telephone Co.

The clause of the franchise referred to by President Hunter is as follows:

"The said companies, party of the second part, also agree and bind themselves to connect the lines of second party's telephone system in said city with the line or lines operated by any and all other telephone companies doing business outside the city of Indianapolis, in the state of Indiana, desiring such connections, making application therefor, and constructing its or their said line or lines or connecting lines to the corporate limits of said city; which said connection shall be made on reasonable terms and without discrimination. Provided that the owners of such outside lines, desiring and applying for such connection as aforesaid, shall agree, as a consideration for such connection, to receive and transmit to destination on like terms all messages in which the said companies, party of the second part, may be interested.

"It is understood between the parties hereto that this agreement to connect with such outside telephone lines in the state of Indiana is one of the essential conditions upon which this franchise is granted. In case there shall be any such disagreement between said companies, party of the second part, and the owner or owners of any such telephone line or lines as to the terms and conditions upon which any such connections shall be made as to hinder or delay the same, then such difference and disagreement shall be promptly submitted to an arbitration committee, to be composed of three freeholders and voters of the state of Indiana, one of whom shall be named by the said companies, party of the second part, one by the owner or owners of said outside line or lines desiring connection, and the third by the mayor of said city, and the decision of a majority of said committee, as to the terms and conditions upon which such connection ought to be made shall be final and conclusive upon all such parties."

Judge Hunter urged careful preparation of a utilities law to be presented at the next session of the legislature. This will give a stability to the Independents hitherto unknown and assure them of ready financing.

In his address President Manford Savage, of the National Independent Telephone Association, endorsed commission control if fair and non-political. He urged the adoption of Judge Hunter's suggestion, and recommended action along those lines. Mr. Savage reviewed the changed conditions and expressed confidence that the Independents will successfully meet them. William Fortune, president of the Indianapolis Telephone Company, preferred to express no opinion in regard to the merger at the present time. The initiative looking toward the merger of the companies will probably be taken by the Board of Public Works.

In the afternoon the association unanimously adopted a resolution which heartily recommended the unification of the Indianapolis companies under the Independent companies' franchise, which is to run for thirty years from July 1, 1908.

An important feature of the seventh annual convention of the Indiana Independent Telephone Association, held this week at Indianapolis, was the emphatic declaration of Lewis Shank, mayor of that city, that no merger of the two companies there would be permitted, which did not assure a square deal to the Independent companies outside the city, or which did not safeguard the interests of the residence subscribers in Indianapolis.

"I'm for it," said Mayor Shank, in his address of welcome, "if the outside companies are cared for and a continuance of their toll connections with Indianapolis on a fair basis is made sure. The deal must have the approval of you Independents before it can have mine."

Commenting on the residence business in the city the mayor said that the business men were organized and could protect themselves as to rates, etc., but that the residence service and rates must be such as to be satisfactory to him and to the users before he would approve the deal.

Judge N. G. Hunter, of Wabash, president of the association, replied to the mayor's remarks and pointed out the fact that the outside Independent connections were an absolute commercial necessity to the city, which needed them as badly as the outlying Independent companies needed the city.

Judge Hunter later announced that the connection between Chicago and South Bend was perfected and that all companies now reaching South Bend may obtain excellent service to Chicago.

In the afternoon session on Wednesday, the stockholders of the Toll Clearing Co. met and elected the following directors: N. G. Hunter, Wabash; T. E. Bohn, Ft. Wayne; J. A. Browne, Winchester; W. J. Uhl, Logansport; Geo. W. Beers, Ft. Wayne; Daniel Agnew, Rochester; W. W. Harbaugh, Sullivan; F. R. Strickler, Franklin; M. L. Early, Greenfield; W. L. Bailey, Richmond, and Wm. Fortune, Indianapolis.

These later elected officers as follows: President, Wm. Fortune; vice-president, J. A. Browne; secretary-treasurer, W. J. Uhl.

In his report on the past year, E. V. Hanes, manager of the clearing house, stated that the short haul business had increased about 10 per cent. on the average. A slight decrease was found in the long haul business, ascribed to the night and day telegraph letters.

Pointing out the advantages of membership, Mr. Hanes said: "We took the year's business of three stations that do not belong to this organization, and made a double audit with the following result: Station 'A' would have received three cents less last year, had it settled through the clearing house; station 'B' would have received $6.44 more; and station 'C' would have received $61.46 more. I believe these figures constitute as strong an argument as could be made in favor of settling business through a clearing house."

Lincoln Company Announces New Schedule.

The Lincoln Telephone & Telegraph Co., Lincoln, Neb., is using display advertisements to announce the almost immediate connection of all subscribers with the toll lines

A Cartoon Which Appeared in a Lincoln Paper.

both of the Independent company and the Bell system. Arrangements have also been perfected, it is stated, for the consolidation of the two sets of exchanges in Lincoln and the new rates for the merged service are given out.

Attention is directed to the fact that, whereas, the new rates are higher than either the Lincoln or the Nebraska Bell companies formerly charged, the Lincoln company's rates were based on connection with 1,500 subscribers, as against free connection which will now be given with 14,000. The schedule, which is published as subject to the approval of the Nebraska Railway Commission, is as follows: Business, $5 per month, compared with $4 each for Independent and Bell; residence, $2.50 per month, compared with $2 each for Independent and Bell—new rate $2 per month for two-party line service. It has been finally decided to make the entire merged service automatic. The Bell telephones will, therefore, be replaced with the automatics as rapidly as it is possible to do so.

Practical Subjects—Letters and Discussions

Good Subject for Discussion—What Is Your Idea?

It has been common practice among telephone companies generally speaking all over the United States, to allow 25 per cent. originating commission on long distance business. It has been proven conclusively, that the larger offices are losing money on a 25 per cent. basis. Or in other words, 25 per cent. isn't sufficient to pay for the central office equipment, the maintenance and clearance of toll lines to the city limits, the operating force, the office expense, the collection expense, reporting, etc.

The question naturally arises, "Is 25 per cent. a fair commission?" or "Why was 25 per cent. first decided upon?" This is a matter which, to the writer, seems to be of great importance. First, you find exchanges that are hardly breaking even from year to year. We find that the average toll line company is making a fair return on its money. Even assuming that the toll line company and the exchange company are the same, it is hardly correct bookkeeping and theory unless it is right.

Therefore I am writing you to see, if it would not be advisable to get up a discussion through your columns with a view of determining the proper commission.

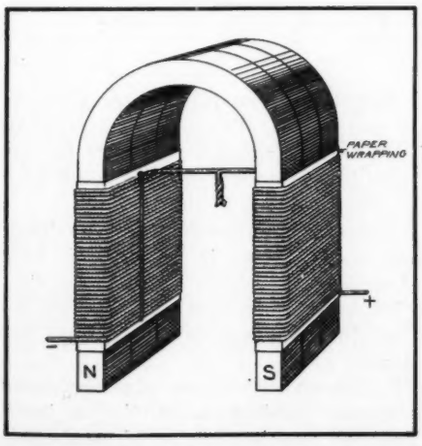
Should we have one commission for large offices and another for smaller offices? Should our commission be on originating business only, or should we pay commission on both originating and terminating business?

Grand Rapids, Mich. W. S. Vivian,
Michigan Independent Telephone and Traffic Assoc.

A Remedy for Ringer Troubles.

Our experience has induced us to believe that a larger per cent. of ringer trouble is due to weak ringer magnets than is commonly suspected. This led us to construct a simple device for remagnetizing them which can easily be made by anyone in a magneto exchange. (This article is not intended for the common battery fellows.)

Take three or four good, strong generator magnets and stand them side by side with like poles together; tie them together at each end and in the middle with twine; wrap the straight part of the magnets on each side with one or



A Home Made Device for Remagnetizing Ringer Magnets.

two layers of thick paper to insulate the winding from the magnets, tying it on. Now take No. 20 or No. 22 annunciator or magnet wire and wrap two layers of it on the paper on each set of poles cutting the string ties out of the way as you come to them and terminating your winding three-quarters inch from the end of the magnets.

Slip one or two pieces of string between the magnets and the winding and tie the ends on top of the winding. This will prevent the coils separating and slipping off the ends of the magnets. Connect the proper ends of the windings on each side of the magnets so that the two windings will assist and not oppose each other. This can be determined by remembering that if you place the end of a coil toward you and pass a current through it from left to right or in the direction of rotation of the hands of a clock, the south pole will be near and the north pole away from you. In this case imagine the magnet as a straight bar.

Try the magnets with a compass and find which is the north pole. Mark it, and observe how the coil should be connected to the batteries so as to strengthen the permanent magnets. Tag the positive terminal so that a mistake will not be made later. If the current is passed around the magnets, as shown in the illustration, the polarity will be as indicated. The apparatus is now ready for business and should be used with two or three new dry batteries. In using it, the ringer magnet is dropped on the poles of the device several times remembering that a jar assists the magnet in taking the magnetism.

It may take five or more minutes to saturate a ringer magnet but the device will do it thoroughly.

When it is not in use, place a bar of iron across the magnets as they will gradually lose their magnetism if this is not done.

The next time you have a bell that does not ring right and you can hardly tell why, just try a treatment with this contrivance and notice the result.

Kansas. U. S. H.

TO WIRE CHIEFS AND MAINTENANCE MEN.

Clearing of troubles which occur in your exchange, inside or outside, may be made the subject of short, practical letters which will interest other telephone men These TELEPHONY *will gladly publish, if illustrated by diagrams or photographs. Simply write a description of the nature of the trouble, tests and location, cause found, and method of repair. Payment will be made for all letters published.*

Troubles Near Transpositions.

When I was a beginner in the telephone work in 1906, a bridging line developed unusual symptoms of nervous collapse. Transmission was, apparently, perfect; ringing was reduced to zero. After the two regular trouble men had each been over the line and failed to find it, circumstances prevented their making further search. The wire chief then told me to get a team and see what I could find.

The first day I became pretty well acquainted with the line and got a first class country dinner. The second day I started out again. When I reached the first telephone, I tried ringing central. Nothing doing. I then opened the line and rang central *O. K.*

I had tried "for an hour" to ring central from a point about 80 rods beyond, the day before, without success. Therefore, I assumed that I was getting close to the situation. It was even so.

After leaving a "Murphy" transposition, the line ran through a walnut tree. A small branch had grown up and

pushed the wires close together and had grown around them. They were just far enough apart to allow the talking currents to pass but the heavier ringing currents would arc cross. Being near a transposition, the line appeared to be *O. K.* from the road.

Another peculiarity of lines came to my notice this past winter. The operators complained that a certain trunk circuit did not ring well. I put the voltmeter on for a test. It showed short about three miles out. On reversing the line, the needle dropped slowly back to nearly zero.

The trouble was caused by sleet on a single point transposition which was tied in on an ordinary double groove insulator.

York, Neb. Rufus Comstock.

Investigation of Credit of a Prospective Subscriber.

The question of credits in telephony is one of steadily increasing importance. With the cost of plant upkeep and satisfactory maintenance on the ascending scale, as it is nowadays, a telephone company cannot afford to rest secure while holding what might be considered a reasonable number of bad accounts. The subscriber who pays for his first quarter and then refuses payment for the second quarter, allowing his service to be cut off and his instrument to be removed, is a source of loss just now, because of the increased cost of doing business.

The Louisville Home Telephone Co., Louisville, Ky., believes that every possible attention should be paid to the credit of old and new subscribers alike, with a view to minimizing the percentage of bad accounts on its books within a year's time.

The Louisville company rigorously investigates credit, just as any other business house might do. The contract department relies to a great extent upon information secured from a credit rating book, published by a syndicate of Louisville credit agencies and credit men employed by various prominent business houses. The book is generally reliable, affording an index to the standing of tens of thousands of individuals.

In the event of a prospective subscriber not being listed in the rating book, the company's contract department requires one or two references, a procedure not altogether common with telephone companies. Occasionally in the face of an undesirable rating given the prospect in the credit association's book, the assurance of a couple of reliable references given by him, such as representative concerns with whom he has done business, will serve to right him with the telephone interests. The vouched-for credit of a prospective subscriber, backed by the recommendation of men with whom he does business, is more valuable for a telephone company than credit records which may or may not have been accurately compiled, according to the company's policies.

Some Explanations of the Grounded Line Trouble.

In reply to "What's the Answer?" under "Practical Subjects" in the May 11 issue of TELEPHONY, I assume that the ten grounded lines, mentioned ran metallic from terminal to drops; one side of each pair being connected to No. 6 wire and in turn to the galvanized pipe, and the other side to line and telephones, telephones being grounded at residences. When the operator signaled the subscribers on the line mentioned, the resistance being greater than on any of the others, which perhaps were 80-ohms bridged, counterbalanced at the junction of ground wire and terminals, thus causing the ringing current to flow back over the sleeve side of the pairs, and signaling the operator on the drops mentioned.

Sylvia, Kans. J. F. Huffman.

Following is my idea of the trouble experienced by W. G. Cumming related in the issue of TELEPHONY for May 11.

By way of illustrating my point of view, let us consider three lines, *A B* and *C* of which *A* and *B* are individual lines and equipped with 1,000-ohm ringers and *C* is a four-party line with 1,000-ohm bridging ringers. All are grounded lines using a common ground at the central office.

I think we all agree that in order for the ringing on line *C* to throw the drops of lines *A* and *B*, current in some manner must pass through them.

If current is sent out over line *C*, it will pass to ground through the four telephones on that line, and this current must return in some way to its starting point at the central office. There are several ways in which it may do this. One is through the office ground provided for that purpose, and another is through the telephones and drops of lines *A* and *B* to a common point at the ground connection and then to its starting point at *C*.

Ordinarily most of the current would take the path provided for it, but if for any reason the resistance of this path becomes excessive, enough current will pass by way of the telephones and drops of lines *A* and *B* to throw those drops.

On the other hand, while ringing on either line *A* or *B*, there will not be enough current reach the ground through the 1,000-ohm ringers to divide in sufficient quantity through the various paths of the return circuit, to be noticeable.

Therefore I think it is probable that the electrolytic action of the carbolineum, creosote and water on the pipe used for the office ground, caused sufficient increase in the resistance of that path so as to cause the cross ringing.

Indianola, Iowa. F. K. Noel.

I wish to make a guess at the cause of the trouble referred to by W. G. Cumming in last week's issue of TELEPHONY.

An iron pipe should be more than seven feet in the earth when used as a common ground for a number of grounded lines for, even if the earth is wet, there will be enough resistance in such a ground to cause cross-talk.

I think it likely that the cross-ringing was caused by the creosote from the pole seeping into the earth around the pipe and thus increasing the resistance.

The probable reason for the cross-ringing occurring only when the operator rang over a certain line, is that the impedance of the line, ringers and ground connections was lower on that particular line than on any of the others. This caused a stronger current to pass through the drops connected to the common ground when ringing on it, than when ringing on any of the other lines.

Gordon, Neb. W. F. Hankins.

Telephone Men Join the A. I. E. E.

The May issue of the Proceedings of the American Institute of Electrical Engineers contains the names of the following men interested in telephone work who have been elected associate members of the Institute.

Albert J. Barnes, telephone engineer, Maritime Telephone & Telegraph Co., Halifax, N. S., Ray S. Hoyt, electrical engineer, American Telephone & Telegraph Co. New York, Edgar. G. Jones, Western Electric Co., New York, Carlyle Kittredge, facilities engineer, Michigan State Telephone Co. Detroit, Mich.

Edward E. Clement, telephone engineer, patent attorney, and patent expert, Washington, D. C., has been transferred from the grade of associate to that of membership grade.

Denies A. T. & T. Purchase of Pacific Bell.

U. N. Bethel, vice-president of the American Telephone & Telegraph Co., says that there is no truth whatever in the rumor that the Pacific Telephone & Telegraph stock will be exchanged for American Telephone & Telegraph. It was reported that two shares of the subsidiary would be exchanged for one share of the parent company.

Legal Cases and Decisions

By A. H. McMillan

Competitive Construction in Oregon.

This company owns and maintains a telephone line along the country road on 25 ft. poles which carry three wires placed on wooden brackets. This lead was gained, or notched, for cross-arms when originally constructed seven or eight years ago, and was duly constructed under a county franchise about one or two feet from the fence.

Our statute (Lord's Oregon Laws, Sec. 6245) provides that the right and privilege is granted to any corporation to construct, maintain and operate telephone lines along public roads and highways, exclusive of streets within incorporated cities; and provides "that county courts shall have power and authority to designate the location upon such roads and highways . . . where such fixtures may be located, and may order the location of any fixture or fixtures to be changed when such court deems it expedient and any fixture erected or remaining in a different location upon such highway than that designated in any order of such county court shall be deemed a public nuisance and may be abated accordingly."

Further than a formal permission to use the highways so as not to interfere with public travel or use, the court did not designate our location, but has entered no objection to the route selected and used for some years.

A farmers' mutual incorporated company, in competition with this company, recently constructed a line within the fence and upon private property, but so close to the fence that their cross-arms extend out over the road. This line consists of 17 ft. poles, excepting at road crossings and grades, where they are 25 ft. in height, which is the same height as this company's poles. It is the intention of our company to place cross-arms upon these poles and string several new circuits thereon, but in many cases we would be prevented from doing so on account of the fact that the ends of the competitive company's cross-arms and the cross-arms we contemplate placing our poles would overlap.

We wish to know if under these circumstances we can compel the competitive company to make way for us and what the remedy is.

A telephone company which has established a lead of wires is entitled to room enough in the lead to add future cross-arms and wires to supply the necessary demands of the public service as evidenced by increased business. The first established company is therefore entitled to a reasonable amount of space on its poles for new cross-arms and wires to meet this possible increased demand of the public. Northwestern Telephone Exchange Co. vs. Twin City Telephone Co. (Minn.), 95 N. W., 460.

As we understand the fact, your county gave you general permission to use the highways so as not to interfere with public travel or use, as you erected your poles. Later your competitor constructed a line on private property, but so close to the public highway that their cross-arms extend out over the road and interfere with you so that you cannot add new cross-arms and wires to meet the increased demands of public service. Your remedy would be by injunction. See McMillan on Telephone Law, Section 145.

Parallel Electric and Telephone Wires.

We are operating a telephone system in this village and have a franchise from the council to place our pole lines in the streets and alleys. Now the city is building and installing an electric light plant. Has the light company a right to place its pole lines in parallel and exactly in line with ours, with the poles going up through our wires? Please tell us also the distances from our wires the light company must keep its wires.

We do not think the electric company has a right to parallel your lines on the same side of the street, or to put its poles up through your wires. Between an electric light company and a telephone company, the one first rightfully in possession is entitled to protection against interference by induction on the part of the one subsequently erected. Nebraska Telephone Co. vs. York Gas & Electric Light Co., 27 Neb., 284; 3 Amer. Electrican Cases, 364

The rule for induction between parallel lines is that it is inversely in proportion to the square of the distance between them. Rocky Mountain Bell Telephone Co. vs. Salt Lake City Railroad Co., 3 American Electrical Cases, 356; Chicago Telephone Co. vs, Northwestern Telephone Co., 65 N. E., 329.

Liability for Change of Street Grade.

In the business, or fire district of this city our wires are enclosed in cables and laid in the streets below the surface. They were put at a depth below the surface indicated by the city authorities and under the supervision of the latter, being placed in cement ditches or conduits. We thought the work was so far below the surface that there would never be any trouble or additional expense on account of change in the grade. In 1909, 1910 and 1911, the city made excavations in the street and changed the grade of the street from the depth originally contemplated to a much greater depth, reducing the grade below the depth where our cables were laid. This forced us to re-lay our cables and conduits and to dig new ditches for the reception of them. The expense was nearly $3,000. Our rights in the city are by a franchise granted us in 1904. What are our rights in the premises? Can we make the city reimburse us for the expense to which we have been put?

There is a marked distinction between the protection given under the constitution of the state of Mississippi to abutting owners and to mere licensees in the street. A licensee takes his rights in the streets subject to any change in grade or subsequent difference in the use of the streets. A street is an easement for the accommodation of public travel and of those things incident thereto.

Other uses to which the streets may legitimately be put are the laying of water and gas mains, cables and the like, and such additional use must always be subordinated to the principal use, that of accommodating the public travel and transportation. So when the interests of the public require a change in grade of a street or road, the subordinate uses must yield to the principal use. The same would be true as to abutting property owners were it not for the constitutional provision mentioned above which guarantees them compensation for injuries to their property resulting in change of grade.

Pole Taxes Cannot be Levied for Gain.

Please advise us of the different decisions where the pole tax license has been reduced in the state of Pennsylvania, giving dates of same, and any other particulars connected with the different cases that you know of.

Our franchise calls for fifty cents per pole as a license fee "for the use of the borough." We contend that a borough cannot charge for gain, and as the franchise states "for the use of the borough" we contend that this tax is more than the law would allow the borough.

You are correct in your contention that a borough cannot levy a pole tax or license fee for gain or profit. The fact that the franchise states "for the use of the borough" does not determine that this tax is greater than the law would allow the borough. Wisconsin Telephone Co. vs. City of Milwaukee, 104 N. W., 1009.

That would be a question of fact to be determined by the evidence. Such a tax is intended to compensate the borough for the extra expense to which it is put because of expense of telephone lines in the highways and the necessity of taking extra precautions for the safety of the public in regard thereto. The decisions upon what is a reasonable pole tax are quite varied, as they rest upon different circumstances in each case. Fifty cents for each pole of an electric light company was held an unreasonable tax where the cost of inspec-

tion was only about one-tenth of that amount. Saginaw vs. Swift Electric Co., 113 Mich., 660; 72 N. W., 6.

In a case of the United States Supreme Court, it was held that a license fee of one dollar for each pole and $2.50 for each mile of wire in a borough of Pennsylvania was void because the only work done upon the poles and wires by the employes of the borough was the counting and assessing of the poles. The elements which enter into such a license tax are the necessary or probable expense incident to the issuing of a license and the probable expense of such inspection, regulation and police surveillance as the municipal authorities may lawfully give to the erection and maintenance of the poles and wires. Schellsburg vs. Western Union Telegraph Co., 26 Pa. Sup. Ct., 343.

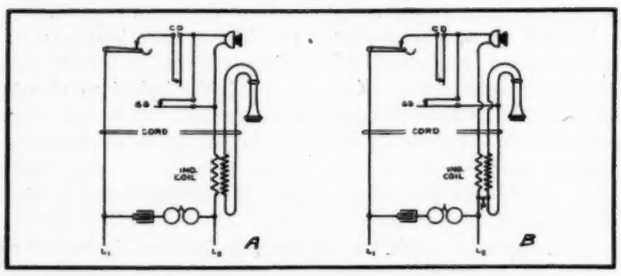
The other decisions upon the same subject are given below, but for the dates you will have to refer to the decisions themselves. Braddock Borough vs. Allegheny Telephone Co., 25 Pa. Sup. Ct., 544; Borough of Kittanning vs. Western Union Telegraph Co., 26 Pa., State, 346; Norwood Borough vs. Western Union Telegraph Co., 25 Pa. Sup. Ct., 406; St. Louis vs. Western Union Telegraph Co., 148 U. S., 92; 149 U. S., 465; Delaware & Atlanta Tel. & Tel. Co., 73 At., 175.

Queries on Theory and Practice

Shunting Out Receiver of Automatic When Calling.

We have a desk set which has been cut over to work on the two-wire automatic system, and can not shunt out the receiver while the dial is sending impulses. I enclose a diagram of the present wiring. The cord is a four conductor one and we do not want to put in more conductors on account of the maintenance expense.

The difficulty can be overcome by connecting the secondary winding of the induction coil to the primary winding. The diagram *A* shows the present wiring of the desk set. *CD* is the impulse contact of the calling device and *SS* the shunt springs, the function of which is to reduce the line resistance and to cut out noise in the receiver during the sending of impulses.



Automatic Desk Stand Wiring.

In diagram *B*, the same set is rewired so that both transmitter and receiver are shunted. The terminal of the primary of the induction coil nearest the line, has been connected to one terminal of the secondary. The shunt spring has been wired to the cord conductor which is attached to the common point, *P* of the induction coil windings. Hence, when the calling device is in operation and the shunt springs closed, both transmitter and the primary of induction coil will be short circuited. This will result in keeping the noise out of the receiver, as desired.

The Vibration of a Receiver Diaphragm.

How does the receiver diaphragm cause sound to be sent out into the air? Is it by actual vibration in the ordinary sense as we understand vibration, or may it be a molecular action? It seems to me that the action is so slight that it can not be actual motion of the metal to and fro. Kindly decide this point for me.

In answering this interesting question we must keep in mind the nature of sound. The ear, as far as we are able to determine, is affected only by actual vibration of some sort. This vibration may come to it through the air, which is the usual way, or through some solid, which is unusual. When a telephone receiver is pressed against the external ear and a conversation received, the vibrations come from the receiver diaphragm through the air to the ear drum. Whatever the diaphragm does, it succeeds in agitating the air. From the slight changes in magnetism which occur in the iron diaphragm, we know that it must be an actual to and fro motion of it which causes the air to move. When hard steel is suddenly magnetized or demagnetized, it emites a slight sound. This can not be the case in the receiver diaphragm, for the magnetic changes are far too slight, and the iron is so soft as to change its magnetic state easily.

The talking relay has been noted by several persons. In this case it is also an actual motion of the relay armature which makes the sound in air, although the armature may be screwed up tightly against the poles. There is still considerable room for motion due to the bending of the parts. If the armature had a ground joint fit to the poles, the sound would vanish. The writer has cured a humming transformer by clamping the laminations very tightly, so that they could not move.

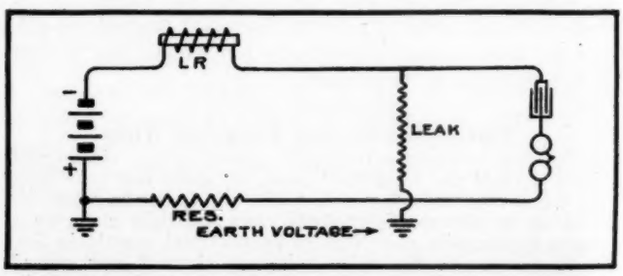
The receiver diaphragm certainly has a true vibration.

A Case of Permanent Signals.

With a common battery switchboard we had been running with the battery connected a certain way. The battery was reversed and all lines acted the same as before except those which were leaky. These came in with permanent signals. When we cleared the grounds, they were all right. Why did the signals show up that way?

It may be that before reversing the battery, you had the line relays in the line which came from grounded battery. In this case, a leak on that wire would not show up on the board. Since you indicate that merely the battery was reversed, leaving the lines the same as before, there must be another cause. This was most likely, the polarity of earth voltage as shown in the diagram:

Before making the change, the earth voltage opposed



How Earth Voltage May Affect a Leaky Line.

that of the exchange battery so that the leak was unable to display the line signal. The effective voltage was the difference between the battery voltage and that of the earth. When you reversed the exchange battery, the two voltages were acting in the same direction and caused enough current to flow to actuate the signal.

Sparks from the Troubleman's Department

Remarks by Mr. Oldsubscriber.

By R. D. Mock.

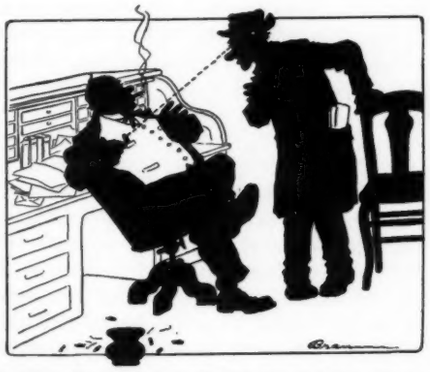
One day when Mr. Oldsubscriber came into the manager's office, he found that official sitting in his easy chair with his feet on his desk, a cigar in his mouth tilted at the angle a well-behaved guy anchor usually takes.

"Well, I do declare!" began Mr. Oldsubscriber. "I came in thinking that perhaps the manager might lend me a cigar and a match for a half hour, but I see the manager is out and that my old friend Self-Satisfaction is holding down the chair. Glad to meet you again, Mr. Self-Satisfaction."

"That's all right," defended the manager. "It is entirely fitting and eminently proper that a man be satisfied with himself occasionally, and I don't know any better time for him to begin this indulgence than right after he has done something worth while. Got a couple contracts this morning. Did it myself," and the manager leaned back still farther and slipped his thumbs inside the arm holes of his vest.

"Well, that's good," said Mr. Oldsubscriber. "Glad to hear it. How's chances if I wait around a little while?"

"Oh, I don't feel good enough to pass around the cigars,



"Perhaps the Manager Might Lend Me a Cigar."

if that's what you mean," replied the manager, "but I can't help thinking that after a man has accomplished something useful he rather deserves to sit around and be satisfied with himself for a while. And this morning I did something useful. I got a couple contracts that are going to help out a whole lot."

"Well, I do declare!" exclaimed Mr. Oldsubscriber. "I guess that men are all alike. They may think that they differ from each other politically, or they may not take quite the same stand on the tariff question, but I guess at heart they are all alike. Now, there's Nate Roberts. He's a traveling man, you know. Last Monday noon I met him coming home with his grips. 'What's up, Nate,' I says, 'wife sick?' 'Say,' he says, 'I just took the biggest order of the season this morning. Started away at eight o'clock and at ten I landed this record breaker. So I'm coming home to celebrate for the rest of the week—not going to turn a wheel until next Monday.'

"There seems to be a peculiar kink in human nature," continued Mr. Oldsubscriber, eyeing the cigars in the manager's pocket, "which makes men want to lay off and gloat over anything they have accomplished. If a man constructs a chicken house, he isn't satisfied with completing the job and starting on something else, but he feels called upon to sit around between jobs and tell all the neighbors what a nice hen-bungalow he has built, and then he'll devote the best part of two days to admiring it himself, after which he is ready to begin building a dog kennel or something else. They all do it—that is, all but the people in one profession."

"What profession is that?" asked the manager.

"The experts on the political situation," replied Mr. Oldsubscriber. "We poor experts are loaded down with work all the time. We just get things to running smoothly and then some candidate kicks over the traces, or the donkey refuses to lie down with the elephant and we work night and day trying to solve the difficulty, and by the time we get everything all fixed something else happens, and we must sweat blood explaining the fool moves of some misguided leader. It is an awful task, let me tell you, this thing of being an expert on the political situation. We don't have time to gloat, or to rest either. And that's the way it should be. After a man has done something, is there any excuse for his not doing something else? And why should he take a vacation after everything he does merely so he may have time to pat himself on the back and tell himself what a humdinger he is? But I must move on. This afternoon Sam Bly and I have to solve the old currency question. It's an interesting topic. Care to come along?"

"No," replied the manager, "I don't believe so."

"Well, wander around after you get tired admiring yourself and we'll tell you how the currency question should be solved."

"All right," said the manager, "but hey there! Wait a minute! I don't like your attitude on this topic. After a man has really accomplished something worth while, like I did this morning, I believe he is entitled to a little rest. It isn't exactly self-satisfaction. It's his just dues; he deserves a little vacation to reward him for his previous effort. Now, take the case of Nate Roberts and his big order. If he did a week's work in two hours, he surely deserves the rest of the time for himself."

"Oh, I didn't tell you the rest of the story about Nate and his whopping big order, did I? Well, I saw Nate this morning. He was starting to work with his grips, and he carried the sourest expression on the longest face I ever saw. 'Well, Nate,' I says, 'going out to land another corker?' 'Say,' says Nate, 'don't ever say big order or vacation to me again. After laying off all week on the strength of that nice fat order, what do you think happened?' 'Don't know,' says I. 'Why the dinged fool cancelled the order,' says Nate.

"The queerest talk I ever had over the telephone," confided Myron T. Herrick, recently, "was down in Columbus, when I had the honor of being the governor of this state.

"I was about to retire for the night, when a local reporter rang me up. You must know that I had been reported dead that evening. I was in the best of health, as a matter of fact, but it was said that I had gone the way of all flesh. On this last call I answered the telephone myself. 'Mr. Herrick's residence?' 'Yes, sir.' 'Is he dead?' 'No.' 'Do you think he'll die tonight?' 'I do not.' 'Well, if he does, will you answer the telephone and tell me?' 'It won't be possible, in that case.' 'It won't, eh? Well, get somebody on the line that can help me out—you are useless.' I acknowledged my limitations," continued the new ambassador, "and sent the cook to see if she could do better."

Hattie—I have so many callers that, really, I get quite fatigued.

Mattie—Ah! I didn't know before that you were a telephone operator.

The Relations of the Chief Operator to the Force

A Talk to Chief Operators—The Right Kind of Employes and How to Secure Them—Value of Impressing Upon the Force the Lessons to be Learned from Errors in Operating—The Supervisor and Her Duties

By Percy Redmund

General Superintendent of Traffic, Pioneer Telephone and Telegraph Co.

Take great care in selecting new employes from the girls who apply for work. Telephone operating generally does not require any unusual amount of intelligence, but at the same time it is work of fine detail, which to be properly executed, must be directed by an orderly, healthy brain. Girls with orderly, healthy brains are usually the children of good homes, with careful, discriminating parents; therefore it is from such that the Chief Operator should draw her operating force. If you do not receive applications from desirable girls, find out why. Perhaps the telephone office is not considered by the townspeople a good place in which to work. If that is the case do what you can to change the ideas on the subject. This can be done by advertising. Get acquainted with people who can help spread the word that the work is desirable. Preachers, school teachers, school principals, and the ladies of the town can help you. Take every occasion to tell people you meet about the desirability of the work.

Among the good talking points are the following: Opportunity for advancement; as telephone operating is done entirely by girls, there are many good positions for girl chiefs, supervisors, teachers, etc. The direction of this enormous force of girls offers exceptional opportunities for girls who have natural inclination for leadership. Next is the point that operating work is taught at the expense of the telephone company. The operator does not have to prepare herself by attending a business college, where she has to pay for her course of instruction. On the contrary, the telephone operators are usually paid by the company while they are learning. The care that the telephone company takes of its operators is another desirable feature of the service. It will be found in nearly every city and town that the company provides better working conditions and rest rooms than are offered by any other employers.

The privacy of the operating room insures seclusion from the public. This is another feature which appeals to the desirable kind of girls. The fact that they are employed by a woman who understands women is also worth mentioning. Telephone work is good discipline and many of the traits developed in the operating room become personal attractions in the operator's individuality. For example, evenness of temper, unfailing courtesy, gentleness of voice, etc.

By the way, good telephone service courteous and business-like treatment of the subscribers will help tremendously in giving the public the right ideas about your office and the class of girls employed there. The actions of the employes you have will, to a great extent, control the grade of girls who apply.

After obtaining the right kind of girls, the next thing is to make expert operators of them. There are some girls who, although very desirable from a standpoint of personal character, would never make good operators: They may be careless, listless, slow, irritable, nervous, or in poor health. Others may have some physical defect, such as poor hearing, eyesight or an impediment in speech. These should not be employed, as they cannot do the work as you need it done. If an applicant is not clean, healthy and modestly dressed, she should not be considered.

Abstract of a bulletin issued by the traffic department, Pioneer Telephone & Telegraph Co.

The process of developing expert operators varies greatly. Some learn quickly, while others are slow. A standard school course should be followed by all beginners as closely as local conditions will allow, but that is only the beginning of an operator's training. After she goes to the switchboard as a regular operator, the training must be followed up day after day, month after month, and year after year until she is a real expert. Your aim should be to have a force of experts and not a lot of ordinary operators.

This is an age of specialization and competition. You will fall behind in the competition, if your operators are not specialists or experts in their line of work. To improve your operators' work you must watch and study it to see where it is wrong, tell them, explain why it is wrong and how to do it right; also explain why the right way is the best. Appeal to their common sense and reason as well as to their obedience. Tell them "why" whenever you can.

Be sure that your force understands you. Tell them individually and in meetings, that you are trying to help them, trying to improve them and advance them.

Your success and theirs is one. Every failure you have in your force hurts you and sets you back in your effort to get the results for which you are striving. You should be frank with your force and tell them how much they are to you. Let them feel they know you and understand you.

Correction and instruction often fail because misunderstood. When you have occasion to criticise an employe, do so in private, not before others. Do not hesitate to criticise what is wrong, but be sure the intention of your criticism is understood. When you criticise or find fault with one of your employes for doing something which is wrong, be sure that you at the same time, help that employe by telling her what is right. Criticism without instruction will soon break down any force, but criticism with instruction, with explanation, with encouragement, will build up and develop your force, and that is the only way to build it up.

Encouragement is one of the greatest helps to any worker. A telephone operator must have it from her chief. We pay our operators a salary for the work they do for the company, and we do not propose to substitute anything else, such as flattery or jolly. Remember this: Nobody is paid as much as they think they should be and the cash payment alone does not satisfy any one for their labors. Appreciation does not take the place of cash, but salary and sincere appreciation are the full payment for good, faithful work, and neither one without the other, is satisfactory. Therefore I say to you, show your appreciation where it is earned; your employes are entitled to it just as much as to their salary.

In watching the work of your operators, you will be likely to find some girl who is particularly good in some part of the work. Perhaps she has developed a new way of doing something which is better than the old way, or some little knack to quicken up her action, such as picking up the plug and quickly throwing it into the jack. Any particularly good work noticed, should be encouraged and developed and when perfected should be shown and explained to the rest of the force. Give all the benefit of everything new which is developed by any one of them or by anyone else.

In a like way mistakes made by one operator may often

be pointed out to all with the result that all benefit by the mistake of one. Experience is a sure teacher, although often expensive. The company and the chief operator have to pay in many ways for the mistakes of operators. After these mistakes are made, we cannot get way from the trouble they cause, or, in other words, we have to pay for the experience.

One thing you should look out for is to get full value out of the price you have to pay for experience. One of your operators may make a mistake and you have to pay for her experience. You may as well let all the force know about the mistake and then they will all profit by the one's experience. This thing of paying for experience should always be remembered. When you have to pay for somebody's experience try to figure out some way to get the full return for your money. For instance, an operator may connect up a wrong party on a toll call and you are severely criticised for having such careless operators. The girl who made the mistake is told of the trouble caused and, if she fully realizes the seriousness of it, has had an experience which she will probably never forget.

The mistake has been made; something has been done which cannot be undone. We have to pay for this girl's experience. The next question is what are we going to do with the girl. In considering whether or not she should be discharged, remember that experience is a good teacher and that operator surely knows better now. If she stays in the service and profits by the experience, that is probably the best way of getting your money's worth.

Complaints are good teachers. Very often a thorough investigation of a complaint will show up, as the cause, some weak operating which should be pointed out to all of your force. Show your girls what caused the complaint, why it was wrong, and how it can be prevented in the future. Let everybody who can possibly be benefited, get the benefit of everything which happens. Talk about all the work to all of the force. It is your duty to point out the troubles and the cure. You must be a teacher, not merely a fault finder.

As experience is the other teacher that is working hand in hand with you, it is plain that the longer you can keep your employes in the service, the more good teaching they will have had. Experienced operators of long service have a decided advantage over inexperienced operators. It takes some time for operators to become experts. There is a certain ability which only time can bring. Self confidence, speed and exactness in the highest degree can be attained only by practice, or, in other words, length of time in the service.

Operators should be encouraged to stick to the work. Unless you give attention to this, your girls are apt to become restless and after working a few months, think they need a change. Continuous service can be encouraged by recognizing ability in salary and in the assignment of hours. Avoid favors to newcomers and do not appoint to supervisors' positions, strangers who have made a wonderful record somewhere else. Make the work interesting; that will help a lot in holding the force. Work up local pride; get each girl working to make a good record for the office. Get into competition with other offices. Start competition between the operators in your own office. Social meetings of operators are often just as beneficial as business meetings. Do not give your girls all work. Arrange for a little play once in a while; it will hold them together and foster a good spirit.

It is a mistake for a chief operator to think that she cannot mingle with her force and join in their play without losing strength as the leader. One must always be careful, whether at work or at play, to hold the respect of the force. You must never do anything which will lose that respect. While upholding the dignity of your position, see to it that you are not over-impressed with this dignity. Dignity, while absolutely required, must not be overdone, as too much is just as harmful as not enough. A proper bearing toward employes is a matter to which you should give some thought. You should be respected by your force as authority and at the same time loved by them as their best friend.

If your force is large you cannot do all the leading, teaching, directing and supervising yourself, and in that case you have supervisors and assistants. The operators are assigned work under certain supervisors or under the assistant chief operator. Supervisors should be trained to look upon their positions as those of sub-chief operators. They should deal with the operators just as a chief operator would. When a supervisor is on duty, the chief operator should deal with the supervisor and not directly with the operators under her.

Hold the supervisor responsible to you for the acts of the operators and administer all correction and discipline through her. Do all you can to strengthen the supervisor's authority over her operators. Keep in very close touch with her work and the manner in which she uses her authority. Authority should not be given to supervisors until they have shown that they are capable of using it fairly and impartially. When promoting an operator to the position of supervisor, be sure to explain to her what her duties will be, what is expected of her, and what authority is given her. Explain in detail how to teach, help and develop the operators. Give her to understand that she is to be a leader, a teacher, and not merely an overseer. Require her to confer with you before taking any severe action with any operator, in order that you may give her the advantage of your experience, as well as to protect your operators from the hasty judgment of inexperience.

As fast as the supervisor proves capable of handling fuller authority, let her have it, as it will lighten your work and at the same time help her. Train your supervisor for an executive. Teach her the art of training her force. Efficiency in an operating force is its full power of accomplishment, its full strength for getting and holding results. Your work with your force is all for the purpose of making each employe as great a power as possible for producing good service.

Investigations of the Bureau of Standards.

In a report to the secretary of the Department of Commerce and Labor, the director of the Bureau of Standards states that during the fiscal year the number of tests increased to considerably more than double that of the previous annual period. This growth is attributed to the steadily increasing interest of the industries in applying scientific data and principles to manufacturing.

During the past year an extensive investigation into the subject of electrolysis has been in progress. This subject is one of great practical importance, not only to engineering interests but to municipalities and the general public. Damage to water and gas pipes and other underground structures by stray electric currents has long been a source of serious trouble, and although much work has been done by private interests with the view of mitigating the evil, a great amount of investigational work remains to be done before remedial measures can be applied with satisfactory precision. Also during the last few years a great deal of attention has been drawn to the possibility of damage to re-inforced concrete structures, due to stray currents, and much alarm has been created in some quarters lest great damage to buildings, bridges, etc., may result from this cause. Although the possibility of damage of this sort has been established, little was known before this investigation was started in regard to the extent of the damage that had occurred, the conditions under which trouble might be expected, or the best method of mitigating the evil.

The present investigation was undertaken in response to requests from important engineering interests, and in carrying

out the work the bureau has had the hearty co-operation of many engineers, corporations and municipalities, they in some instances incurring considerable expense in order to assist the bureau in the investigations. During the first half of the year under consideration, the work was confined mainly to investigations relating to electrolysis of re-enforced concrete, but early in the present year the work was broadened to include investigations into the general subject of electrolysis, particular attention being given to methods of preventing trouble from this source. A great deal of valuable information has already been obtained, but much important work remains to be done, and it is planned to continue the work during the coming year.

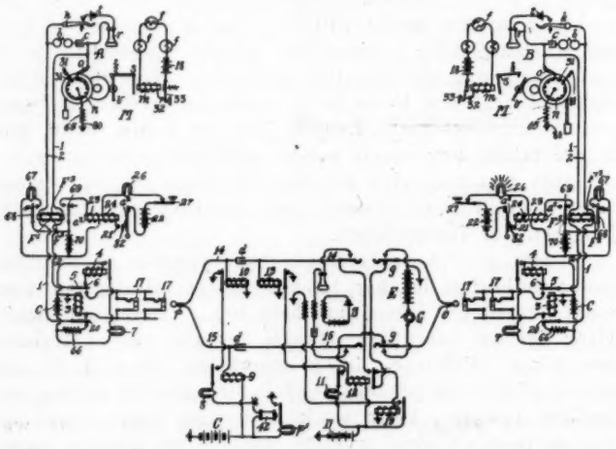
From the Patent Office

By Max W. Zabel

Combined Telephone and Alarm System.

H. G. Webster, Chicago, 1,025,347, May 7, 1912; assigned to Kellogg Switchboard & Supply Co.

The subscribers stations *A* and *B* have the usual apparatus. Each subscriber has the customary line lamp 9 operated by the actuation of the switchboard lever. Lines which are provided for the alarm service, have windings F^1 and F^2 of relay F^3 so arranged as to present little or no impedance to telephone currents. This relay controls a secondary circuit which includes the electromagnet a^3, the vibrating armature a^2 of which responds to impulses of the frequency of the alarm sending apparatus. A definite number of impulses is required before the armature will reach its full range of vibration, the number being that caused by the predetermined revolution of the make and break wheel *m*.



Cabinet.

G. W. Lancaster, Richmond, Va., 1,025,813, May 7, 1912.

This cabinet mounted on a long arm fastened to the floor, carries the telephone apparatus and has provisions to accommodate the head of the user. The arrangement is such that the conversation cannot be overheard by others. The receiver and transmitter are positioned to properly accommodate the user without handling.

Telephone Service Meter.

A. M. Crichton, Quincy, Ill., 1,025,378, May 7, 1912.

In this telephone meter a recording device is located adjacent to the calling subscriber's telephone which will when the called subscriber answers, automatically register that call in plain view of the calling subscriber. Should the telephone exchange operator make a wrong connection, the meter can be reset thus only actual calls being recorded.

Telephone Repeater System.

H. B. Stone, Providence, R. I., 1,025,167, May 7, 1912.

The series windings of this repeater have a special provision to prevent singing. The ordinary repeater is used having the receiving circuit include a receiver, and a transmitting circuit including a transmitter and a source of electrical energy. These circuits are associated with the main line by means of a main repeating coil so constructed as to weaken the currents developed by the transmitting circuit in the receiving circuit, so there is no tendency toward continuous operation known as "singing."

Mouthpiece Attachment.

J. L. Donat, Chicago, 1,025,390, May 7, 1912.

A hollow enclosure for a telephone mouthpiece is provided. An aperture in the front of the regular mouthpiece accommodates the lips of the user so that the conversation is inaudible in the immediate vicinity.

Party Line System.

Judge B. Briggs and V. P. Hall, LaBette, Kans., 1,025,366, May 7, 1912.

A step-by-step party line system is described in which the line circuit between the using telephones and dormant telephones is broken. Suitable indicating means are provided to set forth the number of the telephone which is being called.

Common Battery System.

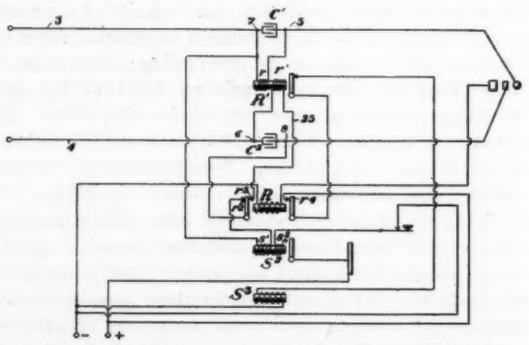
E. R. Hobbs, Buhl, Idaho, 1,025,269, May 7, 1912.

A common battery system is herein provided one of whose objects is to arrange the circuit in such a way that the line terminals test "busy" immediately the receiver is removed from the switchhook. A further object of the invention is to improve the calling end of the operator's cord circuit.

Trunk Circuit.

J. G. Mitchell, Cleveland, Ohio, 1,025,477, May 7, 1912; assigned to North Electric Co., Cleveland.

In this trunk circuit the supervisory relay R' controls the signal S^3. Relay R' is controlled over the *A* end of the trunk through wire 3 to the winding *r* of supervisory relay R' to the tip of the plug of the subscriber's station, back through the ring of the plug, contact i^3 of relay *R*, winding *r* of relay R',



over trunk wire 4, back to the central office. When the called subscriber has his receiver off the hook, relay R' is energized to maintain the circuit of the supervisory signal open. When the subscriber hangs up, then the supervisory signal is displayed. Condensers C' and C^2 are provided. Relay *R* is the cut off relay to restore all parts to normal, upon disconnection.

J. G. Ihmsen, General Manager for Stromberg-Carlson

Pioneer Telephone Man, Who Resigned General Management of American Electric Telephone Co. in September, 1910, This Week Accepts Executive Position in Big Rochester Factory—His Long and Successful Record in Independent Field

J. G. Ihmsen this week assumed the office of general manager for the Stromberg-Carlson Telephone Manufacturing Co., of Rochester, N. Y. This marks the re-entry into the telephone field of one of the earliest and most successful Independent manufacturers. In September, 1910, TELEPHONY chronicled Mr. Ihmsen's resignation from the position of secretary, treasurer and general manager of the American Electric Telephone Co., since which time he has been engaged in looking after his personal interests. For the last year Mr. Ihmsen has been general manager of the Reliance Elevator Co., of Chicago.

J. G. Ihmsen.

Mr. Ihmsen was one of the first four men to engage in the manufacture of Independent telephone apparatus. With B. G. Hubbell, now president of the Federal Telephone & Telegraph Co., of Buffalo, N. Y., he organized the Keystone Telephone Co., at Pittsburgh, Pa., in 1894. At about the same time P. C. Burns and J. E. Keelyn entered the manufacturing field in the West. To these four men must be accorded the honor of establishing the first factories for Independent telephone equipment.

The early days of Independent operation and manufacture made severe demands upon those engaged in either branch of the business. It was necessary not only to build the equipment—pioneering in every sense of the word—but also to create a market for it. The Bell had previously held a monopoly both of manufacturing and operating, and it developed upon the Independent pioneers to overcome these conditions—to build with one hand, as it were, and prepare the field with the other. While Mr. Hubbell devoted himself largely to the factory end of the Keystone enterprise, Mr. Ihmsen spent most of his time in the field, securing franchises, promoting new companies and generally assisting in their financing and organization.

In August, 1898, the Keystone company was merged with the Northwestern Telephone Equipment Co. and the American Electric Telephone Co., under the name of the latter. Mr. Burns became president of the combined concerns and, in March, 1900, Mr. Ihmsen assumed their general management, continuing in that capacity until his resignation in 1910.

Mr. Ihmsen has always taken a prominent part in the proceedings of the National Independent Telephone Association and in those of the state associations as well, serving on important committees and spending both time and money to promote the general welfare. He was also president of the Independent Telephone Manufacturers' Association from the time of its organization until his retirement from the field a year and a half ago.

Mr. Ihmsen comes from one of the old-time Pittsburgh families, which has been closely identified with that city's progress for many years. He was born there on February 1, 1872, receiving his education at Georgetown College. He was first associated with his father in the glass business, under the firm name of Charles T. Ihmsen & Sons. This firm succeeded the enterprise conducted by Mr. Ihmsen's grandfather, Christian Ihmsen, who established the first glass factory west of the Allegheny Mountains. The Ihmsen name was prominent in the glass business continuously from 1812 until the business was absorbed by the United States Glass Co.

Mr. Imhsen's connection with Stromberg-Carlson is considered a fortunate event for both, as he is well fitted to add to the strong position already held by that concern in the field. Before taking up the telephone business he studied law in Pittsburgh. He has never practiced that profession, however, finding in the telephone industry a sufficiently engaging and profitable occupation. He has been a resident of Chicago since March, 1900, and has important interests in that city.

From Factory and Salesroom

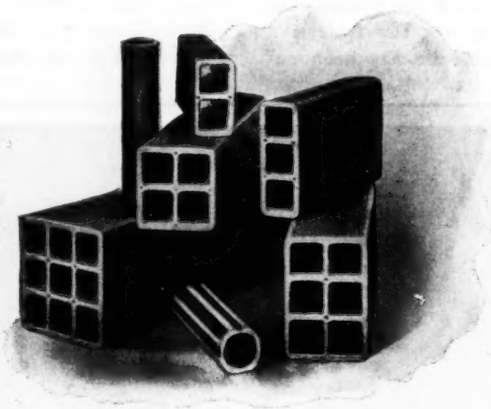
Conventions: Association of Railway Telegraph Superintendents, New York, June 4-7

Underground Conduit Materials.

By William D. Ligon.

The history and development of underground systems of distribution, while extending over a comparatively short period of time, is filled with interesting changes, not only in methods of construction, but also in materials entering into the work.

The first underground system of distribution was undertaken in 1886 and during the twenty-six years which have elapsed, many changes and improvements have been made. Today subway systems have come into general favor because of the permanency of construction, assurance against interruption to the service and low maintenance and depreciation charges. Aside from these advantages, the streets and thoroughfares are improved by the removal of poles and wires which detract greatly from the general appearance of city and country.



Single and Multiple Duct Tile Conduit.

The remedying of such conditions heretofore has been slow and in a measure was due to the lack of sufficient cost data in the hands of telephone, telegraph, railroad and central station officials. The appreciation, therefore, of subway distribution to both community and company has been slowly recognized and, as the advantages have become better understood, the agitation against aerial lines has turned into a co-operative movement whereby the benefits are well appreciated, resulting in the rapid adoption of the subway distribution of electric currents wherever possible.

Like everything else in the electrical field, many improvements have been made in conduit materials as well as in cables, to meet the more severe conditions of service resulting in changes in the types first employed, and it will be found that of the seven types of conduit developed, only two are now in general use. It may also be interesting to name the conduits first employed as follows:

1. The "Edison Tube System," consisting of iron pipe about 18 feet in length, through which the cables were drawn and the tubes filled with an insulating compound.

2. "Troughing," constructed of planks nailed together, in which the cables were laid and protected by an insulating compound, in the same manner as in the Edison tube system.

3. "Cast Iron Multiple Trough," which was simply a substitute for the wood troughing.

4. Wrought iron pipe enclosed in concrete.

5. "Pump Log," made from soft wood, machined out to the proper dimensions and then creosoted.

6. Single and multiple duct tile, formed from clay in 18 in. and 36 in. lengths, respectively.

7. Fibre conduit, made from wood pulp, in 54 in. and 60 in. lengths and indurated with a bituminous compound.

The introduction of high voltage circuits and their protection has had a marked influence in eliminating the older types of ducts, although "Pump Log" is still used by telephone companies for conveying cables in suburban and country districts.

The disadvantages of the older types are numerous, and aside from rendering little protection to the cables, were expensive in first cost and did not possess lasting qualities, thus increasing the depreciation and maintenance charges to an unreasonable degree. The latest and most important development in the art is the introduction of fibre conduit, which was brought about as a result of the exacting conditions of present practice and the necessity of absolute protection of circuits from the dangerous effects of electrolitic action.

Multiple and single duct tile has been in use for about twenty-five years and is manufactured from vitrified clay in single duct, and multiples of two, three, four and six ducts in either round or square bore. The ducts are laid end to end, with dowel pins to hold in alignment, and usually are surrounded with an envelope of concrete about three inches in thickness, as protection and re-enforcement to the entire structure. Joints are staggered and usually wrapped with burlap and cemented with mortar.

This material, if properly vitrified and glazed, will last indefinitely. When free from iron, it possesses high insulating properties and costs less per duct foot, f. o. b. factory, than any other conduit on the market today. It also possesses great mechanical strength and shows an average puncture

Table Showing Cost to Construct Single Duct Tile Conduit In Streets Paved with Granite, or Equivalent Paving, Exclusive of Manholes.

Duct Sections.	1	2	3	4	6	8	12	16	20	25
Excavation, Refilling, Paving and Removing Surplus Earth	$ .259	$ .353	$ .494	$ .430	$ .536	$ .722	$ .788	$ .858	$ .996	$1.072
Concrete	.105	.145	.185	.192	.239	.287	.348	.412	.474	.540
Cost Tile Delivered	.054	.108	.162	.216	.324	.432	.648	.864	1.080	1.350
Laying Tile	.030	.060	.090	.120	.180	.240	.360	.480	.600	.750
Cleaning Ducts	.005	.010	.015	.020	.030	.040	.060	.080	.100	.125
Water, Bridging and Shoring	.005	.007	.010	.012	.020	.025	.030	.040	.050	.062
Tool Repairs and Replacement	.010	.010	.010	.012	.020	.025	.030	.040	.050	.062
Incidentals	.010	.010	.010	.010	.012	.015	.018	.024	.030	.037
Supervision, Inspection and Time-Keeping	.036	.053	.073	.076	.102	.134	.171	.210	.253	.299
Total per Trench Foot	.514	.756	1.049	1.088	1.463	1.920	2.453	3.008	3.633	4.297

test of 25,000 volts dry and 21,000 volts after immersion in water for 150 hours.

Fibre conduit is the most recent addition in materials for subway distribution systems that has been developed to meet the new conditions of service. It has been in use about eight years and is formed in cylindrical shape from fibre or wood pulp under pressure. The wood pulp is thoroughly saturated with a bituminous compound and any vegetable matter or bacteria which would tend to promote decay is killed by the presence of about 6 per cent. of creosote salts in solution.

There are at the present time, two types in general use, known as straight joint and bell and spigot joint conduit. They are made in four styles of joint to meet the general conditions of service, namely, socket (mortise and tenon) joint, sleeve joint, drive joint and screw joint. The fibre conduit is furnished in sizes from one inch in diameter up to four inches and in lengths of four and five feet.

It has been shown that this conduit will stand an average puncture test of 32,000 volts dry and 24,000 volts after immersion in water for 200 hours.

In the introduction of this material on the market there were objections to be overcome, the most serious being as to the life compared with the older styles of conduit which had been tried out. During the eight years of development, this point has been one of greatest discussion and observation, resulting in numerous laboratory and service tests. Samples recently excavated from the first installations show no deterioration, either mechanically or electrically. While it probably is safe to say that fibre conduit will last indefinitely, no one is in position to tell whether impregnated fibre will last for more than fifty years. In basing calculations on the future, the only thing to do is to cite cases which are similar as possible.

Objects have been disinterred and found to be wrapped in cloth saturated in asphalt, evidently having been buried for hundreds of years, and the asphalt in the cloth showed no deterioration except to have become hard. Coal tar pitch and alleged wool felt, which is usually a combination of old rags, wood pulp, straw refuse, cotton and jute, was taken out of the subway which was built by the New York Central & Hudson River Railroad, approximately 35 to 40 years ago, and found to be in perfect condition. However, there is no cause to wonder at this performance, simply because these bituminous substances preserve this material indefinitely when oxygen and the actinic rays of the sun are not a factor and destroying agent. This is the case when a piece of conduit is buried in the ground. Furthermore, the creosote salts fumigate the material and stop mould and rot.

There are roofs of buildings, made of bituminous compounds similar to that used for impregnating fibre conduit, that have been subjected to oxygen and the actinic rays of the sun, and which have given good service for more than thirty years.

By the use of fibre conduit, due to the smooth interior and water-tight joints, troubles due to injury of the cable sheath in drawing in the ducts are eliminated. The connection at joints of fibre conduit affords perfect alignment without the use of mandrels or dowel pins, cement, mortar or burlap.

It is also said that fibre conduit is impervious to moisture, gases, acids or other corrosive elements, so that water, gas and stray currents cannot reach the cable protected by this material. It is a good non-conductor, doing away with trou-

Table Showing Costs of Constructing Multiple Duct Tile Conduit in Streets Paved with Granite, or Equivalent Paving, Exclusive of Manholes.

Duct Sections.	1	2	3	4	6	8	12	16	20	24
Excavating, Refilling, Paving and Disposal of Dirt	$ .230	$ .361	$ .546	$ .397	$ .559	$ .590	$ .637	$ .791	$ .867	$ .939
Concrete	.104	.131	.152	.160	.192	.243	.269	.333	.368	.384
Cost Tile Delivered	.053	.106	.159	.212	.318	.424	.636	.848	1.060	1.272
Laying Tile	.030	.040	.060	.080	.120	.160	.240	.320	.400	.480
Cleaning Ducts	.005	.010	.015	.020	.030	.040	.060	.080	.100	.120
Water, Bridging and Shoring	.005	.007	.010	.012	.020	.025	.030	.040	.050	.060
Tool Repairs and Replacement	.010	.010	.010	.012	.020	.025	.030	.040	.050	.060
Incidentals	.010	.010	.010	.010	.012	.015	.018	.024	.030	.036
Supervision, Inspection and Time-Keeping	.036	.052	.072	.072	.095	.114	.192	.247	.292	.339
Total per Trench Foot	.483	.727	1.034	.975	1.366	1.636	2.112	2.723	3.217	3.690

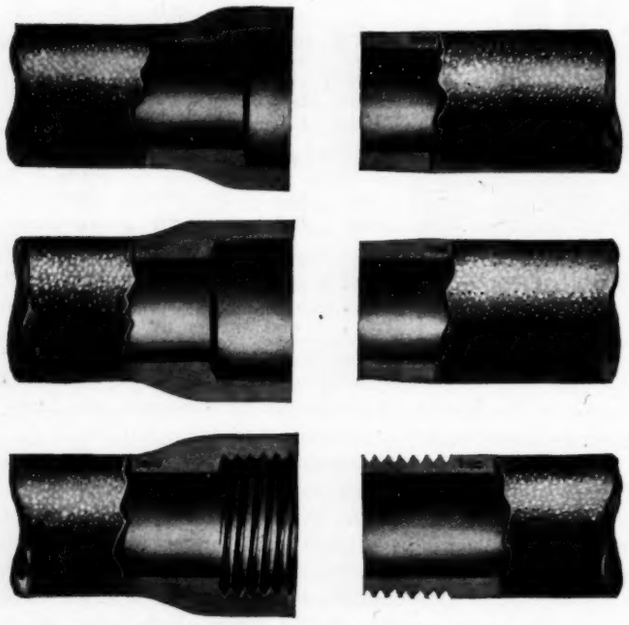
Table Showing Cost to Construct Fibre Pipe Conduit in Streets Paved with Granite, or Equivalent Paving, Exclusive of Manholes.

Duct Sections.	1	2	3	4	5	8	12	16	20	25
Excavation, Refilling, Paving and Removing Surplus Earth	$ .230	$ .343	$ .431	$ .381	$ .481	$ .601	$ .655	$ .716	$ .848	$ .919
Concrete	.090	.126	.163	.175	.224	.273	.344	.417	.490	.572
Cost Fibre Pipe Delivered	.051	.102	.153	.204	.306	.408	.612	.816	1.020	1.275
Laying Fibre Pipe	.010	.020	.030	.040	.060	.080	.120	.160	.200	.250
Proving Ducts	.003	.005	.007	.010	.015	.020	.030	.040	.050	.062
Water, Bridging and Shoring	.005	.007	.010	.012	.020	.025	.030	.040	.050	.062
Tool Repairs and Replacement	.010	.010	.010	.012	.020	.025	.030	.040	.050	.062
Incidentals	.010	.010	.010	.010	.012	.015	.018	.024	.030	.037
Supervision, Inspection and Time-Keeping	.031	.047	.061	.063	.085	.101	.138	.169	.205	.243
Total per Trench Foot	.440	.670	.875	.907	1.223	1.548	1.977	2.422	2.943	3.482

ble with stray currents, and is also claimed to be an absolute protection against electrolysis, which destroys many cables, gas and water pipes each year. It is known that a pressure of five volts will destroy a water pipe or cable in about nine years, and there are few railways, light and power companies, which have not been troubled with electrolysis.

In considering the merits of the two more important materials for underground systems of distribution, it must be understood that each has its important field, and the conditions which govern these installations are to be considered carefully from the standpoint of interest and depreciation on the investment and the best service that can be obtained without interruption.

The question of mechanical strength of fibre or tile when



Joints of Johns-Manville Company's Fibre Conduit.

laid in concrete is of little importance, as the best concrete today will stand a compression test of about 3,000 lbs. to the square inch, which is ample to meet the most exacting conditions of service.

Paragraphs.

THE MANHATTAN ELECTRICAL SUPPLY CO., Chicago, announces that it has leased the building at 1106 Pine street, St. Louis, and will open a branch store about June 15. A full and complete line of its manufactured goods and general supplies will be carried. This store will be under the direct management of F. M. Pierce, who is also the manager of their Chicago branch.

THE L. F. NEER CO., of Butler, Ohio, has succeeded the Ever Ready Co. and will continue the manufacture of soldering flux for telephone purposes.

D. VAN NOSTRAND CO., publishers and booksellers, announces the removal of its offices and salesroom to larger quarters at 25 Park place, New York.

THE NAUGLE POLE & TIE CO., Chicago, has moved its offices from 226 South La Salle street to 5 South Wabash avenue, Chicago.

"YOU ARE INVITED" is the catch line on the Alfred F. Moore mailing card this month. From the pleasing appearance of the girl on the cover, one invitation should be sufficient to obtain enough acceptances to more than fill her automobile. The card gives a few pertinent points regarding the exceptional service of the Alfred F. Moore organization and also states that its experimental department is at the service of customers who have wire troubles to overcome. These cards are issued monthly and any telephone man may be placed on the mailing list for them by writing a postal.

H. H. MANNY, of Manny-Meyers Co., Seattle, Wash., manufacturers' representative, has been in Chicago the past week. Mr. Manny is very optimistic about telephone conditions in the Northwest this season and predicts an unusually good year.

The Manny-Meyers Co. besides representing the Runzel-Lenz Electric Mfg. Co., Cracraft, Leich Electric Co. and Hubbard & Co., is also handling Ironite and other Paragon specialties for the Paragon Sellers Co. of Chicago. Mr. Manny is said to be an enthusiastic ball-fan.

The Kellogg Company's Michigan Representative.

B. H. Blake of the Kellogg Switchboard & Supply Co. has recently been appointed representative for that company in its Michigan territory. He fills the vacancy left by C. D. Boyd, who has entered the automobile field.

Mr. Blake first entered telephone work in 1903 at Canton, Ohio, under A. S. Williams, who was, at that time, general manager of the Star County Telephone Co. He worked in various departments and as timekeeper for construction crews for about six months, and then became night wire chief for this company.

B. H. Blake.

A year later Mr. Blake went to Cleveland to assist in the cutting over of the main office to new Kellogg equipment. After three months, at Cleveland, he went to Massillon, Ohio, to take a position as wire chief.

The next year he joined the Dean company and served for several years in the installation department. A promotion to salesman, with territory in Pennsylvania, New York, New Jersey and West Virginia followed. Later he was assigned territory in Michigan, Indiana and Ontario, Canada.

Leaving the Dean company in 1910 Mr. Blake took a position as foreman of installation for the Western Electric Co. in the Cumberland territory.

In November 1911 he entered the employ of the Kellogg Switchboard & Supply Co. as salesman. He is thoroughly acquainted with the telephone field and no doubt will be successful in his new territory.

Vote-Berger Co. Increases Sales Force.

The Vote-Berger Co., of La Crosse, Wis., reports a most successful season up to the present time for the sale of the D & T anchors. The sales force is to be increased by the addition of two new men, one of whom will travel in the Central states and the other will cover the states along the Pacific Coast.

As the latter representative, Don E. Campbell has been selected and is already working in the territory adjacent to San Francisco. Mr. Campbell has been more or less associated with electrical work all his life and for the past ten years has been traveling in the Western states. He is a man of unusual caliber and well known to the electrical and telephone trade. Already his work for the Vote-Berger Co. is beginning to show results.

New Diamond Expansion Bolt.

An improvement in one-part screw anchors, known as "Diamond N" screw anchor, has been placed on the market by the Diamond Expansion Bolt Co., 90 West street, New York. The regular pattern has been used for years with perfect

satisfaction in making all kinds of attachments in various lines of trade requiring expansion bolts. It is found that the new "Diamond N" screw anchor while containing all the good qualities of the regular pattern, has added advantages in greatly increased holding capacity and greater convenience in use.

The transverse ribs at the inner end of the shield give a

The New "Diamond N" Screw Anchor.

uniform and secure bearing. They grip into the fiber of the material in which the anchor is inserted and present a greater surface of contact than was the case with the series of Diamond points.

The longitudinal ribs at the outer end of the shield are intended to bind in the wall with a driving fit when the screw is inserted. These ribs are for the purpose of preventing the shield from turning when the screw is turned into it.

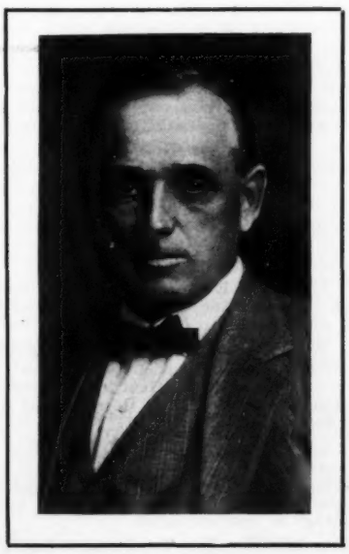
The maximum expansion being at the inner end of the shield, permits of a powerful hold, and has in many cases pulled out a section of the wall in extracting the bolt from the hole.

Fred Seeley—Representative of Chicago Tel. Supply Co.

Brief mention was made in a recent issue of Fred Seeley having formed a connection with the Chicago Telephone Supply Co. at Elkhart, Indiana, after many years of service with the Swedish American Telephone Co. TELEPHONY believes that many of its readers who have had the pleasure of meeting Mr. Seeley personally will be interested in the accompanying reproduction of his portrait.

Mr. Seeley prior to entering telephone work was engaged with the Pittsburg Plate Glass Co. as field superintendent of gas. His connection with this company extended over a period of ten years. From 1889, he worked for various companies in the Indiana natural gas fields.

His first connection in telephone work began in 1903 when he became associated with the Swedish American



Fred Seeley.

Telephone Co. as salesman. He remained with this company up to a recent date, and during his eight year's connection with this company became well known to telephone men.

Mr. Seeley has worked in 33 states and also in Canada from British Columbia to Quebec, so that he will be at home in whatever part of the country he may be called upon to visit.

Exhibits at Indiana Convention.

The exhibits at the annual convention of the Indiana Independent Telephone Association, held this week at Indianapolis were interesting and well patronized. Among the manufacturers and dealers represented were the following:

SPECIALTY DEVICE CO., of Cincinnati, with J. W. Becker in attendance. The company showed the Bierce cable roller, the Bierce sleeve and the Bierce anchor. The latter was demonstrated by a small model which effectively showed its holding power.

THE STROMBERG-CARLSON TELEPHONE MFG. CO., of Rochester, N. Y., was represented by E. C. Lewis and E. P. Shafer, of the Chicago office. A full line of common battery and magneto telephones was shown, together with the company's intercommunicating system, switchboard parts, etc.

M. F. KANE, assistant manager of the Electric Appraisal & Inspection Co., Cleveland, Ohio, displayed Pyrene, the fire extinguisher particularly adapted to use in telephone exchanges, and specimens of the company's new Morse tree insulator. He was also prepared to demonstrate the merits of the Telephone Fire Insurance Exchange.

THE COFFEY SYSTEM & AUDIT CO., of Indianapolis, Ind., was represented by John W. Coffey, who displayed a full set of the forms and loose leaf books of his accounting system, which is especially devised to promote accurate accounting for telephone companies.

THE KELLOGG SWITCHBOARD & SUPPLY CO., of Chicago, had an extensive exhibit including a 150-line magneto switchboard, with 100 lines equipped; a 50-line *P. B. X.* common battery board; a No. 9*A* straight ringing pole changer; No. 17*A* 20-line, secret ringing harmonic pole changer; convertible magneto and common battery telephones; the company's new ebony common battery wall sets; a full line of magneto and common battery telephones and parts, desk stands, indestructible receivers and mouthpieces, etc. The representatives of the Kellogg company present were: L. D. Kellogg, J. C. Kelsey, J. C. Murray, A. J. Carter, G. A. Joy, J. A. Russell, Perry J. Eubanks, F. C. King, B. H. Blake and H. B. Dudley.

THE DEAN ELECTRIC CO., of Elyria, Ohio, was singularly unfortunate in its exhibit, although by no means in its representatives. The exhibit, an elaborate, carefully-planned one, went astray on the road. But, despite the bareness of the room, the company's men—W. H. Scott and E. L. Klingel, from the factory, and P. K. Wood, state representative—managed most successfully to keep the Dean name before the delegates, distributing cigars and good cheer with both hands.

THE NATIONAL CARBON CO., Cleveland, Ohio, showed its Columbia batteries under the supervision of E. F. Meyers and S. S. Wilson.

FRANK B. COOK was ably represented by J. M. Moore, of Chicago, who showed the No. 10 switchboard protector, the *S.* 6 and *S.* 16 pole cable terminals and the *B.* 7 subscriber's station arrester, both in whole and in part.

THE CRACRAFT, LEICH ELECTRIC CO., of Genoa, Ill., was another exhibitor which came to grief in the delivery of its goods. A. C. Reid, its representative, however, made excellent shift to interest visitors with a magneto harmonic converter which had fortunately come through safely.

THE AMERICAN ELECTRIC CO., of Chicago, had an extensive exhibit in charge of Eugene L. Brown, sales engineer. It included a 150-line Burns Express switchboard, comprising many interesting features; the No. 43 desk set, of simple construction, requiring the removal of but one screw to disassemble; the Burns telephone bracket; the No. 360 magneto wall set, with detachable shelf holding generator and wiring; the No. 11 talking set, hand microphone, and a variety of common battery desk sets, "germ-proof" glass mouthpieces, etc.

THE ILLINOIS ELECTRIC CO., of Chicago, was represented by

D. E. Wescott, of Elkhart, Ind. He displayed the Duplex Metals Company's products and the Orr Pole reinforcement. The application of the latter was shown by a small model, which perfectly illustrated its operation.

THE INDIANA STEEL & WIRE CO., Muncie, Ind., had the genial "Bob" Miller, its general sales manager, on the ground.

W. H. PEARL was on hand in the interests of the Central Electric Co., of Chicago.

THE AUTOMATIC ELECTRIC CO., of Chicago, installed a complete 100-line automatic unit, fully equipped and working, with several telephones attached. The exhibit was in charge of John H. Ainsworth, newly appointed Ohio representative, J. E. Fisher and C. G. Williams.

THE ERICSSON MFG. CO., of Buffalo, N. Y., was represented by the Indianapolis Electrical Supply Co., which showed a full line of Ericsson Steel telephones, test sets, switchboard parts, "hand mikes," etc. The exhibit was in charge of C. R. Hutchinson, from the factory, and A. L. Chill, local representative.

THE NUNGESSER CARBON & BATTERY CO., Cleveland, Ohio, was represented by Warner Jones, who carries the Nungesser products all over the United States. A line of batteries was shown.

THE VARNEY ELECTRICAL SUPPLY CO., of Indianapolis, showed a very complete line, including Paragon specialties, Ironite wire, Utica linemen's tools, Clayton & Lamber torches, Runzel-Lenz cords, Columbia dry cells, American Electric arresters and fuses, Indiana Steel & Wire Company's iron wire opalescent glass electric signs, etc. The exhibit was looked after by C. H. Stegmaier, A. L. Waddell, E. A. Driman, E. S. Abrahams, J. T. Goodman and J. A. Arthur.

THE MINERALLAC ELECTRIC CO., of Chicago, was represented by J. R. Calhoun, H. S. Sines, who showed the Unity insulator, Minerallac insulating compounds, etc.

THE MONARCH TELEPHONE MFG. CO., of Ft. Dodge, Iowa, was represented by Lyman Q. Trumbull, sales manager, who showed a 150-line magneto switchboard, a complete line of common battery and magneto telephones and parts, and private branch exchange and intercommunicating equipment.

"GENE" ZELUFF, the pole man, representing the National Pole Co., of Escanaba, Mich., was "on the job" early and late.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

PERSONAL.

L. STANLEY has resigned his position of manager for the South Texas Telephone Co. at Port Arthur, Texas. He has been succeeded by George Dunaway.

A. PODMORE, assistant engineer to the Constantinople Telephone Co. (Societe Anonyme Ottomane des Telephones de Constantinople), left London recently to take up his duties in Constantinople.

VERNON BAIRD, district and local manager of the Cumberland Telephone & Telegraph Co., at Covington, La., for the past three years, has been promoted to the management of the Lake Charles office.

FRANK R. MOTT, formerly general manager of the Bell Telephone Co., of Missouri, and who recently has been retained by the American Telephone & Telegraph Co. on its property expert staff, has severed his connection with the Bell companies.

H. J. O'KEEFE, who has been acting manager for the British Columbia Telephone Co., at Nelson, B. C., has been made superintendent of the Kootenai and Boundary districts. H. A. Nicholson, manager at Grand Forks, has been transferred to Rossland and will be succeeded by J. Sowerby, of Vancouver. J. Fitzhugh, of Vancouver, becomes manager at Greenwood, succeeding H. Kirk.

C. E. NORTON, who has been the manager of the Cumberland Telephone & Telegraph Co., at Shelbyville, Ky., for the past four years, has been promoted to the position of manager for the district, including the counties of Shelby, Spencer, Henry, Oldham, Trimble and Carroll. He will retain his residence in Shelbyville, which makes the local office district headquarters. His successor is J. P. Parrish, of Winchester.

OBITUARY.

JOHN M. C. MARBLE, one of the incorporators and first president of the Los Angeles (Cal.), Home Telephone Co., died recently in New York city after only three days' illness.

Colonel Marble was widely known in Los Angeles' financial and business circles, having been founder and for seventeen years president of the National Bank of California, of Los Angeles. In company with Gen. M. H. Sherman, he started the first successful electric street car line in that city. Before coming to Los Angeles, he was prominently identified with banking and insurance interests in the state of Ohio.

Colonel Marble leaves his widow, Mary L. Marble, one daughter, Elizabeth, and two sons, John E. Marble and William C. Marble, all residents of Los Angeles.

NEW COMPANIES.

DOVER, DEL.—The American Telephone Co., capital $40,000, is reported as having been incorporated by the following Chicago men: J. J. Comer, H. G. Rosenberg, S. W. Goldsmith and H. A. Goldsmith. No information is given as to the company's proposed headquarters, or the field in which it proposes to operate.

WESTPHALIA, KANS.—The Farm & Grange Telephone Co., capital $5,000, has been granted a charter. The incorporators are: J. F. Bierley, H. A. Brown, of Westphalia; L. M. Reynolds, Jos. Selanders, of Colony, and H. G. Bloom, of Mt. Ida.

FRAZEE, MINN.—The Frazee Telephone Co. has been incorporated with $11,000 capital stock. The officers are: President, W. F. Just; vice-president, I. L. Swain; secretary and treasurer, E. F. Gummer. The foregoing, with C. L. Gummer, constitute the directorate.

MORRISTOWN, MINN.—The Morristown Telephone Co. has been formed here. The capital stock is fixed at $10,000. Officers are: President, Geo. Bahr; vice-presidents, Henry Knduss and Wm. Liebrenz; secretary, L. F. von Eschen; treasurer, L. A. Kisor.

WENDELL, MINN.—The Wendell Telephone Co., with a capital of $10,000, has been incorporated by T. A. Boyd, M. L. Adams and others, of Wendell; and S. S. Wengsness, Elbow Lake.

TULIN (R. F. D. from Concord), N. C.—The Tulin Telephone Co. has been incorporated, with $10,000 capital stock, by Geo. J. Gouger and others. Local and toll lines will be built.

HETTINGER, N. D.—The Hettinger & Cedar River Telephone Co. has been incorporated, capital $10,000. It is proposed to build lines in Adams county. The directors are: Wm. W. Anderson and Andrew W. Anderson, of Hettinger, and Maurice Donnelly, of Indianapolis, Ind.

HARMONY, N. J.—The Hopatcong & Harmony Telephone Co. has been formed here, with a capital stock of $2,500. The incorporators include H. B. Bossard, R. F. D. No. 2, Phillipsburg.

OSTRANDER, OHIO.—The Delaware Mutual Telephone Co. has been incorporated here, not for profit. Address C. J. Eckelberry.

CHILHOWIE, VA.—The Love Mill Telephone Co. has been incorporated with $5,000 capital stock. The officers are: W. C. Parks, president; D. A. Gray, vice-president; J. E. McSpadden, secretary, all of Chilhowie.

WAYNE, W. VA.—The Echo Telephone Co., authorized capital $1,000, has been organized here by L. T. Thompson, Theron Ball, D. Holland, all of Genoa, and others.

OAK HILL, W. VA.—The Oak Hill Telephone Co. has been incorporated, with an authorized capital stock of $25,000. The incorporators are: Cal. Mankin, George M. Jones and J. G. McLain, of Oak Hill, W. Va.; J. W. Coleman, of Mossey, W. Va., and W. W. Ogden, of Prosperity, W. Va.

CONSTRUCTION.

COLCHESTER, ILL.—The Colchester Mutual Telephone Co. is maturing plans to rebuild its exchange here. A modern, fire-proof building is contemplated.

ALBERT LEA, MINN.—The Tri-State Telephone & Telegraph Co., of Minneapolis and St. Paul, is preparing to build a number of toll lines in this vicinity. One will run from Albert Lea to Mankato, and another to Winnebago and Blue Earth. The Kiester Telephone Co. also expects to extend its lines materially this summer.

GASTONIA, N. C.—The Piedmont Telephone & Telegraph Co. is preparing to run some extra circuits between Gastonia and Charloeet. The line is about twenty-five miles long.

CLARKSVILLE, TEXAS.—The Texarkana Telephone Co. is planning to expend between $8,000 and $10,000 in practically re-

building its local plant. Some 400 subscribers will be added. Arlie C. Stewart is manager.

CLINT, TEXAS.—The Clint Telephone Co. has adopted plans for the construction of several extensions of its long distance system.

FRANCHISES.

ALTURAS, CAL.—The Leland & Myers Corporation has been granted permission to construct and maintain a system from Alturas to Round Valley.

ROCHELLE, ILL.—The city council has granted a twenty-year franchise to the Flagg Center Telephone Co., of the township of Flagg, to construct and operate a telephone line in the city.

WOODSTOCK, ILL.—The McHenry county board of supervisors has granted the Northwestern Telephone & Telegraph Co. a franchise to build lines in the county.

WASHINGTON, IND.—The Pike County Telephone Co. has applied for a franchise for local operation. The matter is still before the city council.

CROSBY, MINN.—A franchise has been granted the Aitkin-Deerwood Telephone Co. here, and long distance connections will be had with Duluth and other state points.

SHARON HILL, PA.—The borough council has granted permission to the Keystone Telephone Co., of Philadelphia, to bring its lines into Sharon Hill.

ROCKWALL, TEXAS.—A Mr. Thaxton, of Venus, Texas, has been granted a franchise here for the installation and operation of a telephone system.

FINANCIAL.

PORTLAND, IND.—The Co-operative Telephone Co. has increased its capital stock from $15,000 to $20,000. A. R. Henry is secretary.

BARDSTOWN, KY.—The Woodland Mutual Telephone Co. has increased its capital from $500 to $1,000.

FRANKFORT, KY.—The Dabney Telephone Co., Pulaski county, has increased its capital stock from $2,000 to $4,000.

RISING SUN, MD.—The Cecil Farmers' Telephone Co. has declared a 6 per cent. dividend.

COLUMBUS, OHIO.—A quarterly dividend of 1½ per cent. on the preferred stock of the United States Telephone Co. was declared at a recent meeting of the stockholders and directors, payable May 15.

BROOKVILLE, PENN.—The Summerville Telephone Co. has increased its capital stock from $30,000 to $50,000

RUTLAND, VT.—The Rutland County Telephone Co. has declared a dividend of 6 per cent.

ELECTIONS.

ALBION, ILL.—The Edwards County Independent Telephone Association has elected officers for the ensuing year as follows: President, G. R. Saxe; secretary, Frank Coles, Jr., treasurer, Ben L. Mayne.

HARRISON, NEB.—The annual meeting of the Red Line Mutual Telephone Co. was held recently and the following directors elected: J. W. Keifer, Jr., Ed Semke, M. J. Tegley, Wilson Beanblossom and W. J. Feller.

MOONEY, IND.—At the annual meeting of the Mutual Telephone Co. the following officers were elected: Geo. Hanners, president; James Martin, vice-president; Jacob E. Tanner, secretary and treasurer; Enoch Clampit, Geo. Black, Elmer Alman, James Arthur and Jessie Banks, directors.

RUSHVILLE, IND.—At the annual meeting of the Rushville Co-Operative Telephone Co. four directors were re-elected for a two-year term. They were Ben. L. McFarlan, John D. Megee, J. M. Amos and William A. Jones. The other three directors, elected last year and who retain their places, are: Frank Reynolds, John H. Frazee and Robert L. Tompkins.

SOUTH BEND, IND.—At a meeting of the stockholders of the Home Telephone Co., held recently, B. L. McCormick was elected to fill the vacancy on the board of directors caused by the death of C. T. Lindsey. The other seven directors, Joseph Harris, H. A. Harris, S. F. Harris and Herman Kiper, of Chicago; Horace G. Miller, Elmer E. Daicey and Elmer R. Stoll, were re-elected.

CEDAR RAPIDS, IOWA.—The Cedar Rapids & Marion Telephone Company's officers for the ensuing year are: G. E. McFarland, of Omaha, president; Chas. S. Hall, of Omaha, vice-president; J. M. Rider, of Cedar Rapids, secretary and treasurer. Mr. Rider will also continue to act as general manager.

DETROIT, MICH.—Officers and directors of the Michigan State Telephone Co. have been elected for the year. The directors are: U. N. Bethell, N. C. Kingsbury, Theodore N. Vail, New York; Alonzo Burt, D. M. Cummings, B. E. Sunny, B. W. Trafford, Chicago; William Judson, Dudley E. Waters, Grand Rapids; Truman H. Newberry, Henry Russel, Detroit. Officers elected are: President, B. E. Sunny; vice-president, Dudley E. Waters; vice-president and treasurer, Alonzo Burt; vice-president, B. W. Trafford; secretary, Charles S. Mosley, Chicago; assistant secretary, Walter I. Mizner, Detroit; general counsel, L. G. Richardson; attorney E. G. Stevenson; general manager, H. F. Hill; general auditor, B. S. Garvey.

ADRIAN, MINN.—At the annual meeting of the stockholders of the Midland Telephone Co. the following officers were re-elected: President, J. T. Smallwood; vice-president, C. A. Sands; secretary, Edwin Brickson; treasurer, W. R. Mansel; manager, Eldon Kilpatrick.

BELFAST, N. Y.—The Allegany Telephone Co. held its annual stockholders meeting recently at which the following officers were elected: J. J. Donald, president; Geo. I. Fisk, vice-president; John W. Hunt, secretary; R. E. Lang, treasurer.

EAST PEMBROKE, N. Y.—Stockholders of the East Pembroke Telephone Co. have elected as directors Dr. Richardson, Albert L. Hamilton, H. William Dyer, C. Cash Day, Eugene H. Miller, Ezra A. Seamans and Herbert J. Safford.

PENN YAN, N. Y.—The Benton Telephone Co. has elected officers for the ensuing year, as follows: President, J. K. Turner; vice-president, Henry Earle; secretary and treasurer, Ansley B. Long.

WARWICK, N. Y.—At the annual meeting of the Warwick Valley Telephone Co. the three directors whose terms expired were re-elected, as follows: J. W. Sanford, G. F. Ketchum and F. C. Cary.

GREEN PARK, PA.—At the annual meeting of the stockholders of the Perry County Telephone & Telegraph Co. held at Landisburg, Pa., the following directors were elected: R. J. Makibbin, J. J. Wolif, W. S. Seibert, D. H. Sheibley and J. M. Moose. The officers are as follows: R. J. Makibbin, president and general manager; J. J. Wolif, assistant general manager; J. C. Waggoner, secretary; James Wilson, treasurer.

RUTLAND, VT.—The officers of the Rutland County Telephone Co. were re-elected at the recent annual meeting. They are: President and manager, A. W. Foote; vice-president, T. E. Grover; treasurer, H. E. Sanford; secretary and auditor, D. S. Carpenter. The directors are: T. W. Foote, W. R. Foote, of Pawlet; W. F. Otis, of Danby, W. E. Grover, of Middletown Springs; W. H. Bingham and H. E. Sanford, of Rutland.

JEFFERSON, WIS.—The annual stockholders' meeting of the Jefferson Mutual Telephone Co. was held recently and J. M. Bienfang, R. B. Hellen and O. F. Roessler were re-elected directors. These hold office as below: R. B. Hellen, president; O. F. Roessler, vice-president, and J. M. Bienfang, secretary and treasurer.

WILSON, WIS.—At a meeting, held recently, officers and directors were elected by the newly organized Wilson Telephone Co. There are as follows: H. Herbst, president; Peter Kemmet, vice-president; Peter Frehammer, secretary; C. Roehborn treasurer; C. Grehm.

MISCELLANEOUS.

ARGOS, IND.—Claude A. Warner, formerly of the Macy (Ind.), Telephone Co., has purchased a half interest in the Argos Telephone Co., owned by Edgar Metheny. Mr. Warner takes charge at once.

MACY, IND.—Luther E. Greenwood, of Atkinson, Ind., has purchased the plant of the Macy Telephone Co.

PIPESTONE, MINN.—The Fulda Telephone Co. has taken over the lines of the Reading Telephone Co. The latter owned the exchanges at Wilmont, Reading and Rushmore, together with numerous rural lines in the vicinity of those places, and about 2,000 telephones.

NASSAU, N. Y.—Inspired by the raised rates of the New York Telephone Co., it has been decided to form a co-operative company here, which will connect with the Stark lines at Chatham. Over $1,000 has already been subscribed. The farmers are expected to join in the movement which, it is claimed, will result in an initial installation of upwards of 1,000 telephones. Among those who have subscribed stock are John L. Bame, Delmar Lynd, S. W. Utter and Ralph M. Cooper.

FARMINGTON, UTAH.—Telephone subscribers in Davis county have been notified by the Mountain States Telephone & Telegraph Co. of the purchase of the Home Telephone & Electric Co., a Davis county corporation, by the Bell interests. The notice announces a general increase in rates.

TOPPENISH, WASH.—Members of the local farmers union plan to build a line about twenty-five miles long to serve the hay growers west of the city and afford them a terminal at Toppenish.

YORKTON, SASK.—Shareholders of the Yorkton Telephone Co. have disposed of the system to the government, and Yorkton's system will become part of the Saskatchewan long distance system.

UNDERGROUND.

EVANSVILLE, IND.—An appropriation of $75,000 has been made for the construction of conduits in Evansville by the Cumberland Telephone & Telegraph Co.

MANKATO, MINN.—The Citizens Telephone Co. has asked permission of the council to lay conduit on several streets in the business section. It is believed that the right will be granted.

ALTOONA, PA.—The Bell Telephone Co. has completed plans for the extension of its underground cable plant.

TOWANDA, PA.—The Bell Telephone Co. has been granted a franchise to lay its wires underground in the business districts.

APPLETON, WIS.—The Fox River Valley Telephone Co. is said to be planning the placing of some 20,000 feet of cable underground this summer.

In the Rural Line Districts

The telephone central was moved last week to the cement foundation on its lot, just west of its old location. There was practically no disturbance in business and you have to look twice to know that any change has been made.—Ellinville Item, London Mills (Ill.) Times.

Dave Rison has gone to Clinton, Iowa, to help the Automatic Telephone Company replace wires which were blown down and broken in a recent storm. He expects to be busy there for two or three weeks.—Later he returned to Illinois again Wednesday at the earnest request of Leslie Barr and Charles Onyun, who needed him badly here and at Lacon.—Henry (Ill.) Republican.

There is quite a lot of grumbling over our telephone system. There is nothing wrong with system or centrals; over 47 telephones on one wire is to many for good service, especially when every receiver on the line is down, and parents allow small children to have access to their telephones.—Sugar Creek Item De Soto (Wis.) Argus.

We hear they are about to run a telephone line from Anamosa to Olin. For the past six months they have been putting these calls through Morley. The sooner this line is built the better, as the Morley line is so overworked it cannot take care of half the calls.—Morley Item, Anamosa (Ia.) Journal.

The Festina Telephone Co. now has night service at their station here. Not so bad for a burg like ours to have such telephone service.—Festina News, Ossian (Ia.) Bee.

The Mill Creek Valley Telephone Co. now have a telephone in the office of Dr. G. W. and Fred Simpson. With three good physicians on our line we can surely get aid when needed.—Mill Creek News, Huntington (Pa.) News.

Fay E. Kunce, of Hopedale, has invented a telephone receiver holder. This invention can be attached to any telephone, and while talking one may have the free use of both hands. A short person as well as a tall one can use this holder with ease.—Mason City (Ill.) Banner.

The rain and sleet put all the telephone lines out of business in our part of the country on to Jonesboro. We sure realize the value of the telephone when they get out of order.—Pancake Item, Gatesville (Tex.) Messenger.

The telephone exchange has installed a new switchboard and are ready to give good service.—Secor News, Eureka (Ill.) Journal.

The Arkdale Farmers own their potato house, telephone company and store. A co-operative creamery will soon be a reality.—Arkdale Item, Grand Rapids (Minn.) Leader.

There is talk of installing another farmers' switchboard in Glenwood. Whenever the mutual lines get to the point they can't hang together, their finish is not far off.—Ultima Thule Item, Lancaster (Mo.) Republican.

FOR THE LOVE OF MIKE GIRL, COME OUT O'THERE. D'YE INTEND TER SET THERE AND DROWND? THE WATER'S A GITTEN HIGHER EVERY MINUTE. COME ON I SAY.
AW DON'T BOTHER ME. I'M A MERMAID OPERATOR
Brandenburg.

During the recent flood in Delong, many people had narrow escapes from drowning, and many thrilling rescues are reported. Among them was that of Miss Tillie Webb, the telephone operator, who bravely stuck to her post of duty while the water was rapidly filling the office. When rescued by Jonas Pelkey and Ralph Winkler, Miss Webb was in water almost to her shoulders but still working at the board, and it was with some difficulty that she was finally persuaded to leave the switchboard and climb into a boat.—Delong (Miss.) Messenger.